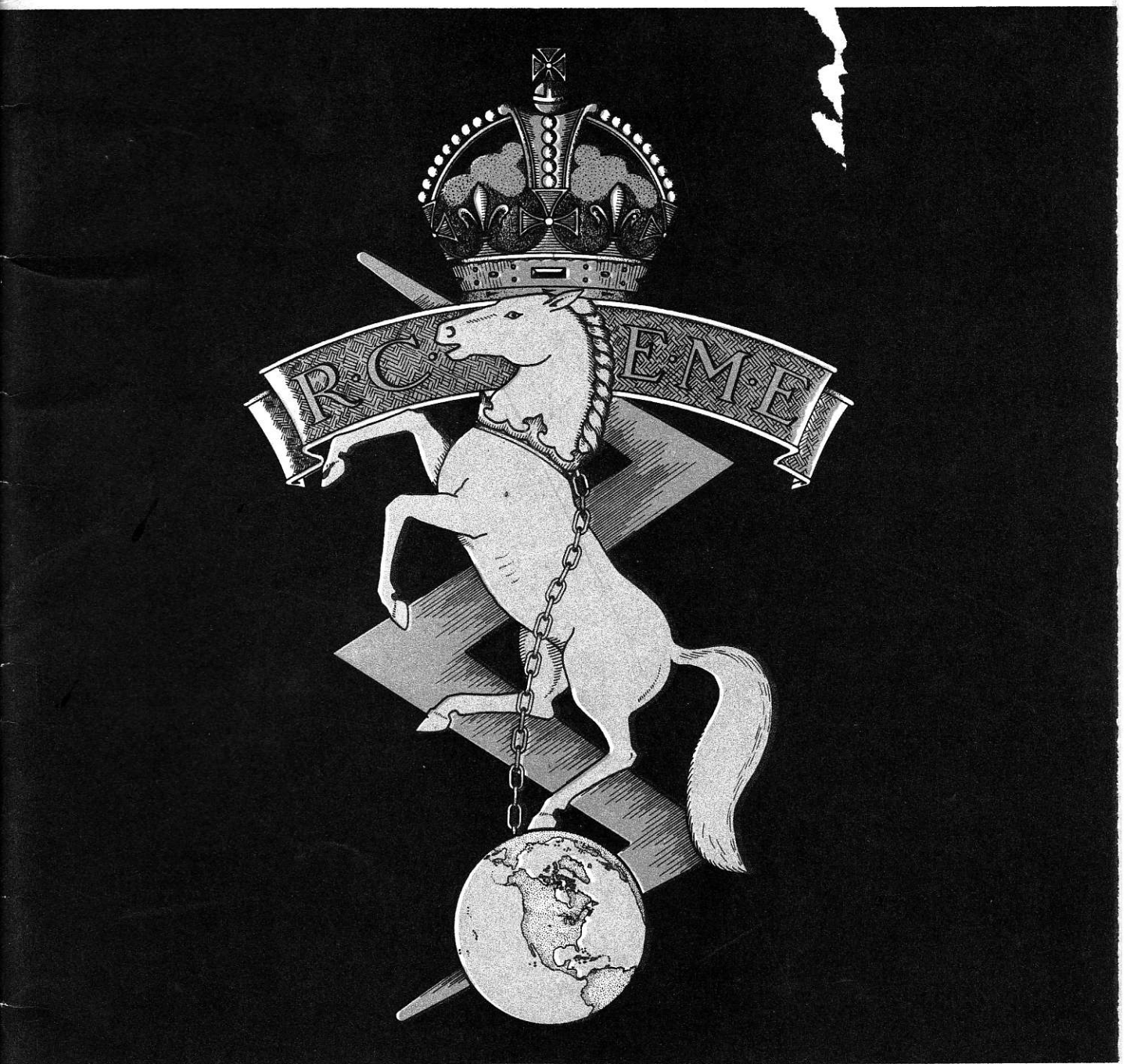
The Armadillo

RCEME

Quarterly



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DIRECTORATE OF MECHANICAL ENGINEERING
A.H.Q. OTTAWA

OTTAWA
EDMOND CLOUTIER, C.M.G., B.A., L.PH.,
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
CONTROLLER OF STATIONERY
1949

The New RCEME Badge

The cover on this issue shows the new RCEME badge. Although notification of the adoption of this badge will be published through official channels, it is anticipated that the design will be taken into use except for uniform dress on the sixth birthday of the Corps, 15 May 1950. It will not be used on uniform buttons or badges until issue has been made to all units and such use authorized.

DESCRIPTION

Cap Badge - Upon a lightning flash, a horse forcene gorged with a coronet of four fleur-de-lys, a chain reflexed over its back and standing on a globe. Above, a crown upon a scroll bearing the letters RCEME. The lightning flash, scroll and crown are gilt; the horse, chain and globe are silver. The crown is the Imperial Crown as shown in CAO 64-2.

Collar Badges and Buttons - Same as the cap badge but without the scroll bearing the letters RCEME. The badges are in pairs with horse's head facing inwards.

Material for Badges and Buttons - For officers and WOsI -

Badges - gilt and silver, or plated
Buttons - gilt

For WOsII, NCOs and men -

Badges - gilding and white metal
Buttons - gilding metal

MEANING OF DESIGN

The horse forcene and chain are symbolic of power under control and the lightning flash of electrical engineering. The horse forcene also forms part of the crest of the Institution of Mechanical Engineers and, together with the lightning flash, is intended to mark the close relationship which exists between the electrical and mechanical engineers in the Army and civil life. The globe is indicative of the impact of mechanical engineering on the world generally.

**

In keeping with our affiliation with REME our badge now has the same design except that the letter 'C' has been added to the scroll, and the northern part of the Western hemisphere appears on the globe. Our Corps will now wear the same insignia as the Electrical and Mechanical Engineers in the other commonwealth armies in Britain, Australia and New Zealand.

**

Cap and collar badges will be issued to WOsII, NCOs and men. It is not expected issues will be available before late summer 1950. Buttons are not being issued.

Sources of supply of badges and buttons for officers and WOsI will be advised later.

THE RCEME QUARTERLY

THE INFORMATION AND STATEMENTS HEREIN ARE NOT TO BE QUOTED AS AUTHORITY FOR ACTION. THE QUARTERLY IS PUBLISHED TO ASSIST RCEME PERSONNEL IN KEEPING ABREAST OF CURRENT TRENDS AND DEVELOPMENTS AND TO CIRCULATE INTERESTING NEWS ABOUT THE CORPS.

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EDITORIAL

We have been criticized by readers (and would-be readers) because the Quarterly appears to be a magazine for officers. To some extent — unfortunate as we think it is — this is the case; limited funds make it impossible to print in sufficient numbers for distribution to all ranks. In that respect only can it be said to be for officers.

The Director, in his foreword to our first issue, stated: "The purpose of the Quarterly is to develop 'esprit de corps' in RCEME.....to promote interest in the all important subject of training the Corps for war." What could be more explicit? Esprit de corps is, we believe, every bit as essential 'below decks' as on the quarter-deck and, equally important, all ranks must be trained for war. So, ORs, let's have your contributions on training, shop innovations, mess affairs of general interest or, as Eastern Command suggested, thumbnail sketches of those well-known 'tiffy' types, so necessary to the Corps.

To quote further from the foreword: "The distribution will be to RCEME units of both Active and Reserve Forces on the scale of one copy per officer on establishment (with a minimum of three to a workshop now—Ed). These copies are intended to be made available to all ranks." Again the purpose is clear. Therefore if you contribute to your Corps magazine there is no reason you shouldn't see your efforts in print, whatever your rank.

The need for interesting material is pressing — it takes 25 to 30 thousand words besides some 25 pictures for each issue of the Quarterly. Let's have your help.

Is the RCEME Reserve Force in Toronto trying to build up their wet canteen strength? We are sure the answer is NO. They do win a fur trimmed, neon lit 'gong', though, for their novel advertising method of using blotter coasters printed with the RCEME crest in the center and the words "JOIN RCEME RESERVE 132 ST. PATRICK ST." printed around the edge.

Canadian TANKS

by Lt Col S. Stucken

A 'Tank', says the precis, is a self-propelled vehicle of the track laying type which combines the qualities of fire-power, mobility and protection. The first British tank saw service in September 1916. This vehicle had a rigid suspension system and a flat steel plate track, and was steered by two tail wheels which were controlled hydraulically. This Mark I tank was about twenty-six feet long by fourteen feet wide and weighed thirty tons. It carried a crew of eight, at a maximum speed of 3.7 mph for a fuel distance of twelve miles on 53 gallons of gasoline, compared with the 162 miles at 1 mpg of a modern medium tank. The armour plate was one quarter to one half inch thick. The vehicle was noisy, poorly ventilated, and vulnerable to armour piercing **rifle** fire. During the first war eight models of this tank appeared with various modifications in tracks, transmissions, engines, and suspension systems.

The early type vehicles, on account of their width, had to have the sponsons removed and tracks broken for shipping, in order to clear the railroad loading gauge. Later types were designed to permit the sponsons to be pushed back into the hulls for travelling.

The French provided the models for the first light tank. Produced originally by the Renault Company in 1916, this tank was manned by two men and weighed 7.4 tons. The armament consisted of either a 37 mm gun or a machine gun, and the tank was powered with a Renault 39 hp engine.

During the year 1918, the United States produced a number of these vehicles, using the French designs and drawings, but none were used in action. The American vehicles were powered with a four cylinder Buda engine instead of the Renault; they were slow and very unreliable. In spite of these defects, however, they were about the only operational tanks on this continent. At the beginning of the Second World War, a number of them were obtained by the Canadian Government and used in training.

Renault Tank

DESIGN PROBLEMS

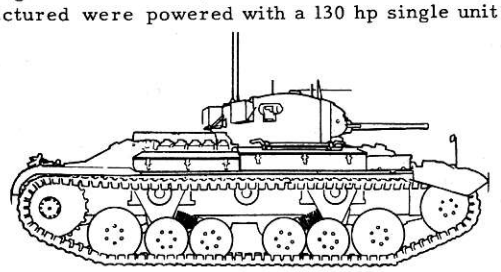
All tank design, like indeed most engineering design, is a compromise between what we want and what we can get. The man who has to find tactical uses for the tank is always after heavier armament, and thicker armour. He transmits his requirements to the designer who in turn has to find an engine which will give the tank sufficient mobility, but at the same time the total weight must be kept within certain limits. If it is not, the tank will bog down in mud, and if the tracks are made wide enough so that the unit track loading is reasonably small, the tank will not conform to the width of a standard loading gauge, and it will be impossible to transport it by rail.

These are only some of the many technical problems which the designer has to face. There is also another type of problem, that of availability of unit components, or shall we say, the problem of procurement. For example, the tug-of-war between the naval services who wanted the 420 hp GM two-stroke Diesel engine for their landing craft and the tank manufacturer who wanted it for tanks and tank destroyers. Yet another problem has to do with deciding whether it is better to freeze a design fairly early for mass production, or whether it is better to be continually improving the product so that it is always a match for the best that the enemy can put into the field. New designs should have their teething troubles remedied before the vehicle is in the hands of its ultimate users; but enough time for this is usually impossible to find in the race of modern warfare, and the scaling of spare parts becomes a matter for intelligent guess work.

The answers to these questions then, were the major factors which forced the adoption of the tracked vehicles used by the Canadian Army in the Second World War.

IMPORTANT TYPES

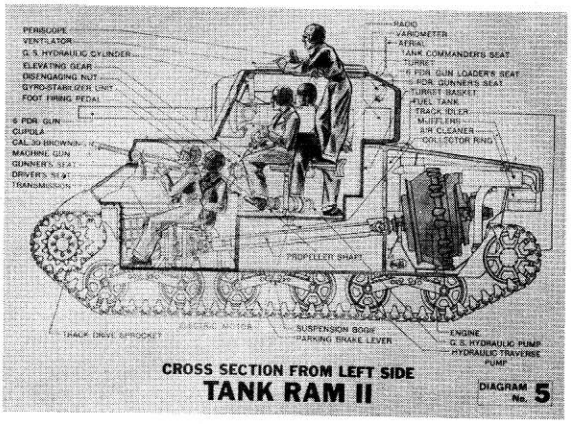
The Valentine (Infantry) tank was made at the Angus Works of the CPR in Montreal, to the original designs of Vickers Ltd, and most of the vehicles manufactured were powered with a 130 hp single unit GM



6.71 two-stroke Diesel. Incidentally, nearly 1,500 were shipped to the USSR and the Russians were very pleased with this small tank. (At any rate they wrote a complimentary letter about it, which was photostated and displayed on the company's notice boards.) The tank had a low silhouette and a 360° turret. Contrary to

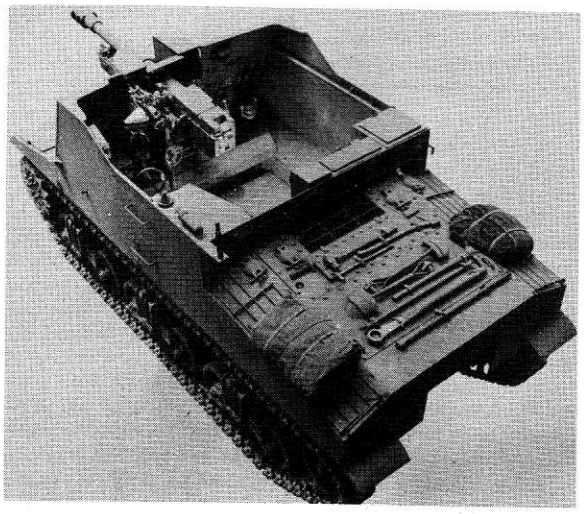
usual practice with medium tanks the steering was by clutch brake, and the track was driven through the rear sprockets.

The Ram I and II, and Grizzly I tanks were built at the Montreal Locomotive Works in fair quantity, and differed from each other only in details of armament and hull arrangement. They were all powered with a 400 hp radial engine. The engine transmitted its power through the propeller shaft to the gear box, and thence to the driving sprockets through a controlled differential in the front end. The engine could be removed through the top of the engine compartment and the 6 pr or 75 mm gun through the rear of the turret. The front end was bolted on to the hull and could be removed all in one piece. It will be noted how the silhouette of the tank is limited by two factors; first, the minimum ground clearance, and second, the clearance which is required above the propeller shaft by the bottom of the turret basket.



CROSS SECTION FROM LEFT SIDE
TANK RAM II
DIAGRAM No. 5

The Sherman, Medium M4A4 tank, was basically the same as the Ram or Grizzly except that it was entirely manufactured in the US and was powered by a 460 hp 5-bank Chrysler gasoline engine.



Overhead view of Sexton 25 pr SP

Self-propelled artillery was represented by the 25 pr field gun mounted on a Ram tank chassis, known as the Sexton; and by the M10 Gun Motor Carriage which had the 420 hp GM Diesel as a power unit and the 3 inch US Army anti-tank gun as armament to start with, replaced later by the British 17 pr. This vehicle is now known as the 17 pr SP Tracked.

ENGINES USED

The three main types of engines used in the vehicles mentioned above were the following.

The Continental Radial 9-cylinder, is an air-cooled engine, manufacturers' number R975-C1, developing 400 hp at 2,400 rpm. This is practically a straight aircraft engine, similar to the Wright Whirlwind, even down to the cowling. It has dual magneto ignition and is supercharged to about 37 inches. The C1 type engine uses forged steel cylinders with machined fins, while the more recent C4 type has steel barrel cylinders with the fins shrunk on in an aluminum muff. As might be expected the cooling of such an engine within its compartment at the back of the tank presented considerable difficulty. The cooling air is drawn by means of a fan partly from the turret space and partly through openings in the upper portions of the engine compartment, in front of the engine. It is interesting to note that the fan absorbs approximately ten per cent of the total output of the engine, ie, nearly 40 hp.

The Chrysler Multi-bank engine (460 hp at 2,400 rpm) is now no longer in use in any army. This consisted of five more-or-less standard 6-cylinder Chrysler automobile engines disposed radially round the main drive shaft. Each engine was connected through gearing to the main drive shaft and could not be cut out independently. The entire system was water cooled by means of a single water pump, and a cooling fan drew air through a radiator located in front of the engine. One advantage of this type of engine was that to all intents and purposes it was a simple multiplication of a commercial automobile engine, and therefore more familiar to the average motor mechanic than either the aircraft engine or the diesel. Its weight however was nearly four times that of the radial air-cooled engine.

The GM two-stroke Twin Diesel engine is the twin model of the same engine (six cylinder) as powered the Valentine tank, and each of the units may be isolated from the main drive by means of an independent clutch. Similar engines are now used to drive inter-urban buses and the weight per horsepower is low for a diesel; the twin unit develops 420 hp at 2,100 rpm. It is still in current use for tanks. The engines are started separately and synchronized, but once the tank is going both clutches are operated simultaneously by means of the driver's clutch pedal. The air cleaners are disposed on both sides of the unit above the blower, which is of the Rootes type and runs at about twice engine speed. There is a governor, and along the top of the cylinders are located six injectors flanked on both sides by twin exhaust valves.

These engines, all with approximately the same horsepower, had widely differing weights. The 400 hp 9 cylinder Radial engine weighed 1,370 lbs; the 460 hp Chrysler Multi-bank, 5,375 lbs; and the 420 hp GM Diesel, 4,855 lbs, (including the clutch in each case).

The total weight of the tank being about 30 tons,

the overall power-weight ratio is not greatly affected, but a ton of extra armament is certainly worth more to a tank than an extra ton of engine for no additional horsepower. It is also important to the operator that the flywheel effect of the in-line water-cooled engines is greater than that of the radial engine, and the tank is thus much easier to drive; further, the performance at lugging speeds is also much better with the in-line water-cooled engines.

A notable factor is the sharp decline in performance of the radial engine at the end of its useful life; that is, as a rule it simply stops dead, or suddenly drops nearly all power. The Chrysler had a much more gradual drop to its efficiency curve; the engine began to lose its tune fairly early in its total useful life, but it would go on turning long after it had begun to exhibit signs of ultimate failure. Tanks were known to have been driven long distances with only three of the five banks of engines in operation. The GM Diesel is a pleasant engine to drive, as its pick-up from low speeds is very good.

The chief controversies which exist in relation to the choice and design of engines for tank work are: (a) whether the engine should be air or water-cooled, and (b) whether the engine should be gasoline or diesel.

COOLING AND FUEL

The use of an air-cooled engine for desert work where water is at a premium, has obvious advantages. The temperature differential of an air-cooled engine, that is, the difference between the ambient air temperature and the cylinder fin temperature is also much greater than that between the ambient air temperature and radiator water temperature, and it is therefore possible to get a reasonable cooling effect even under tropical conditions. At the opposite extreme where sub-zero temperatures occur, the prevention of freezing in the water jackets, and starting-up in the morning, are both important problems. Water-cooled engines are heavier, but are more robust than the air-cooled engine. Diesel engines emit vast quantities of smoke when starting from cold which is a decided tactical disadvantage.

The advantage of diesel fuel over gasoline is that volume for volume diesel fuel will give a greater mileage than gasoline, and the radius of action is accordingly increased; also the fire hazard is not so great with the heavier oil fuel. It is, however, necessary then to make provision for two types of fuel; the ideal would be to have all vehicles and equipment operate on the same type of fuel, thereby reducing supply problems to that extent.

IDEAL ENGINES

It is of interest to note that the US Ordnance gave the matter of the ideal tank engine considerable thought, and the following is a brief specification of it, as given by Col R.J. Icks in his paper (June 1943) on "Engines for Tanks", presented to the Society of Automotive Engineers. The general requirements were: reliability; ease of maintenance; adequate power for the vehicle; long service life; minimum use of critical materials and low overall height. Specific requirements were: 650 gross horsepower; horizontal or 'V' type; air cooling; injection system capable of handling diesel fuel, gasoline or other available fuel and at least 1,000 running hours without major overhaul. It was admitted that the possibility of burning all kinds of fuel from low cetane diesel to high octane gasoline was not yet attainable, although progress in this direction is now being made.

As armour and armament are increased the horsepower/weight ratio, and the consequent performance of the tank, must be maintained by an ever-increasing horsepower output from the power unit. As is well known the horsepower/weight ratio is a direct measure of acceleration. It is also a measure of the ability of a tank to get out of a difficult position; for example, out of a mud hole or a tank trap, where some spare horsepower means the difference between life and death for the tank crew, or perhaps the loss of the vehicle.

Below is given a comparison between a First War tank, Second War tanks, and two well-known unarmoured vehicles, a jeep and a Ford sedan. The table is an interesting one from the point of view of tank design.

POWER/WEIGHT RATIO

Type of Tank or Car	Hp of Engine	Total Wt. (tons)	Power Weight Ratio (hp/ton)
World War I Tank, Mk II	105	30	3.5
Ram or Grizzly Tank Radial Engine	400	30	13.3
Sherman V Tank Chrysler Engine	460	32	13.9
Churchill Tank Bedford Engine	350	39	9.0
M10 Gun Motor Carriage GM Diesel Engine	420	30	14.0
M6 Heavy Tank (USA) Radial Engine	800	60	13.35
M24 Light Tank (Chaffee), Cadillac Engines (2)	250	18	13.9
Willys Jeep	60	1.45	41.5
Ford Sedan Passenger Car	95	1.66	57.3

DRIVES

Anybody who has had to shift gears on the standard 5-speed gear boxes provided on medium tanks knows how different they are from passenger vehicles. Frequently both hands are required on the lever to change gear, and the physical effort of driving is very considerable. In short, the medium tank, in spite of its apparent effectiveness in combat is a cumbersome affair. There is no reason why in time these difficulties cannot be overcome. In the Chaffee, one of the more recent US designs of light tank, gear changing is altogether automatic, being effected by the hydramatic system developed by General Motors. Its precursor, the M5A1 light tank had (or has) a similar system. Although the power-weight ratio of the Chaffee is not very much higher than that of the medium tanks, it is capable of 45 mph on the road and will climb almost anything. The power unit consists of twin Cadillac engines totalling 250 hp. The vehicle is almost

(Continued on Page 19)

RESERVE FORCE

EASTERN COMMAND

The following vital statistics about Reserve Force Units in Eastern Command is submitted for your information:-

UNIT	LOCATION	OFFICER COMMANDING	EFF STR
21 Armd Wksp	Halifax, NS	Maj O.B. Berringer	60
57 LAA Wksp	Moncton, NB	Capt R.R. Colpitts	20
85 LAD	St. John, NB	Lt A.G. McDermott	7
13 Inf Wksp	Sydney, NS	Maj O.B. Coates	50

In the main all these units are suffering 'growing pains' and both officers and NCOs are required to use their ingenuity to maintain the interest of the troops during the period while accommodation and training equipment is inadequate.

21 Armd Wksp accommodation problem is rapidly being solved by the move of the tels, electrical and vehicle component repair shops of 200 Base Workshop and turning the previously occupied space over to the Reserve. This unit also shows considerable interest in sports. They have a sports parade to the garrison gymnasium twice a month for volleyball, bowling and basketball. Also, they have an active hockey team in the Reserve Force League, a basketball team in the formation stage and two rifle teams in the Garrison League. The majority of the recruits are young lads with no military background who are attracted by the opportunity for technical training. This unit has active MT, Tels and Small Arms Sections.

85 LAD, 57 LAA Wksp and 13 Inf Wksp have given little or no technical training to date and have confined their activities to GMT. These units can all see an improvement of accommodation in the near future, which will permit a wider scope of training.

QUEBEC

Headquarters RCEME 3 Div and three of its associated units, 8 Inf Workshop, 9 Inf Workshop and 38 HAA Workshop, are now located in their new armoury at 1055 St. Gregoire St, Montreal; 10 Inf Workshop is located in Sherbrooke, Que. The official opening of the new armoury took place on 15 Oct 49 and was a great success, with many high ranking officers from Quebec Command and AHQ being present.

Lt Col W.I. Playfair is the Commanding Officer of the HQ; Major A.H. Gilmour is the OC of 8 Inf Workshop; Major N.M. Kogan, 9 Inf Workshop; Major G.M. Young, 10 Inf Workshop, and Capt Paul Boire, 38 HAA Workshop.

The total strength of these units at the present time is approximately 170, but with better accommodation and a strenuous advertising campaign, many new recruits are making application each parade night, Mondays and Thursdays.

During the period the units were without permanent quarters, following their vacating the old temporary armoury at 505 Jean Talon Street East, plans for training when the new armoury became available were prepared by the units' officers assisted by the A&T staff. It was considered by the officers that as far as RCEME was concerned, the reserve force could and should train its personnel more effectively on a regimental basis than through the medium of individual workshops, and a training scheme was planned on this basis.

For effective and attractive training, it was decided to make a real effort to obtain the necessary telecommunications and mechanical equipment and the types of machinery, such as lathes, drills, presses that are required by the various tradesmen. Success in this connection was finally achieved through the co-operation of all concerned, both at Quebec Command and at AHQ. The result will be that when the installation is completed, this unit will have an excellent tels shop, MT shop, as well as a first class artisan shop. The setting-up of the new machinery is being done by the units' own personnel.

At the present time, GMT training and junior NCO training are proceeding, and senior NCO training is in the preparatory stage. Basic electricity training for all trades and all ranks will be started almost immediately. By the early part of January the machinery will be ready in the artisan shop and training will be started there without delay.

The intake of officers is satisfactory and there is much more enthusiasm now that the units have permanent quarters and a reasonable amount of equipment to conduct courses on. Excellent liaison is maintained with the McGill COTC contingent and those cadets interested in RCEME are planning to visit the armoury during the second week in Jan..

A very successful Christmas party for unit members and their families was held on 17 Dec, when good entertainment and well-chosen gifts were provided for all the children.

Generally speaking, the accommodation for the Montreal units is satisfactory, except that a drill hall is required for GMT and sport activities.

Accommodation is the big problem for 10 Inf Workshop in Sherbrooke but in spite of this Major G.M. Young "is doing an excellent job" (see July Quarterly) and if provided with suitable quarters "will not have to take second place to anyone", to quote the CREME.

CENTRAL

The position of the RCEME Reserve Force in Central Command is becoming more stable and per-

manent as each day goes by. No precedent existed to guide the organization and operation of RCEME Reserve Force units and it has to date been a matter of steady plodding, with trial-and-error developments throughout. RCEME Reserve like other corps is fortunate in having a firmly established background of tradition and experience on which to fall back on. RCEME can call upon its war time experiences, but the circumstances of war and peace are entirely different, and it is the circumstances of peace that face the reserve at the present time. This steady plodding is slowly but surely achieving the results that have been our ultimate aim. Nevertheless, the problems are many.

Accommodation has been the greatest stumbling block and in some instances continues to present problems. This for the most part has been overcome by the persistent efforts on the part of the Commanding Officers in locating suitable quarters, and the able and willing hand of 'Q' of both Command and Area Headquarters in renting and purchasing them.

Training equipment has provided no problem as far as being available. Some units have had difficulty in obtaining specific items simply because in most cases equipment tables to suit the training commitment adequately are still being developed.

Recruiting has been slow in many centers but this is thought to be correcting itself. The attitude of the ex-soldier is gradually changing. That "I've-had-it" attitude that was prevalent at the termination of the last war is now wearing off and the realization that the Army, whether full time or part time, has its virtues is once more coming to the fore. Bully for it. The army, that is.

The units in Central Command authorized to form are many in number, but not all are organized. The following 'outlines' cover those units at present activated.

HQ RCEME 1 CORPS TROOPS

This headquarters was formed in Toronto on 1 Feb 47, with Lt-Col F.W. Cranston ED as the commander and operated in this capacity until recently (21 Oct 49) when the headquarters was reduced to minimum strength and more or less inactivated until some future date. Major W.H. Ackhurst, the only officer remaining on strength of HQ RCEME 1 C Tps, is at present attached to Headquarters RCEME 2 Armoured Division for all purposes.

HQ RCEME 2 ARMOURED DIV

Lt-Col LeS Brodie is the commander of this Toronto headquarters. The unit strength, authorized as 7 officers and 17 other ranks, is now only 5 officers and 2 other ranks. This headquarters, in addition to its own personnel, has seven Light Aid Detachments under its guidance and attached for all purposes, these being 68 LAD, 69 LAD, 70 LAD, 103 LAD, 106 LAD, 145 LAD and 160 LAD. These LADs consist of the officer personnel only and no effort has been made, or will be made, to recruit personnel until such time as the workshops in Toronto are up to strength. These officers assist 4 Armd Wksp RCEME with their administration and training.

HQ RCEME 2 Armd Div along with 4 Armd Wksp RCEME, are housed in probably the finest accommodation of any RCEME Reserve Force unit in Canada. They have recently acquired a new armoury which is located at 132 St. Patrick Street, Toronto, Ontario, this building is new and RCEME uses the first floor in its entirety. This floor is 115 ft by 72 ft and has been suitably sub-divided to provide offices, medical inspection room, quartermaster stores, canteen and mess facilities and lecture rooms. The offices are finished in birch plywood with birch trim and are equipped with fluorescent lighting. The remainder of the building is finished in fir plywood and fir trim with hardwood floors throughout.

4 ARMOURED WORKSHOP

4 Armd Wksp RCEME located in Toronto is commanded by Major Ian Malcolm. This unit has for the last three years suffered many hardships, mostly poor accommodation, but fortunately they are now blessed with excellent accommodation, this being as mentioned above — 132 St. Patrick Street. In addition to this, two workshop buildings are located a few doors down the street; these two buildings, one of which is 100 ft by 60 ft and the other 60 ft by 20 ft, provide adequate facilities for a complete workshop. The larger of the two buildings is being designed to house the armament section, the small arms section, the instrument section, the vehicle section and the recovery section and has a built-in technical stores and tool crib. The smaller building will house the telecommunication section and the electrical section. Training being conducted at the present time includes Driver Mechanic Course, Fitters Gp 1 Course, Radio Mech Gp 1 and a GMT Course. This unit after three years of operation is now undergoing a complete reorganization as the new quarters open up many fields that could not even be contemplated while in the previous accommodation. Equipment is slowly rolling in and the work requested of the Engineers if progressing satisfactorily.

PROFESSIONAL ADVANCEMENT

19 ARMOURED WORKSHOP

This workshop is located in Oshawa and is commanded by Major F.W. McEwen. Its strength at the present time is 4 officers and approximately 36 other ranks. Accommodation has also been this unit's chief worry. Negotiations are underway for a second-floor accommodation — admittedly not ideal, but far superior to their present quarters. The whole unit, offices, QM Stores, orderly room, etc, are crowded into one small room about 22 ft by 12 ft. In spite of this the unit is soundly organized and has made more than the best of a poor situation.

1 INFANTRY WORKSHOP

Major H.C. Pattison commands this unit in Wallaceburg and it is housed in a very neatly appointed armoury. Alterations have been pending for over two years but these are finally under way. On their completion no trouble is anticipated in recruiting a good unit in Wallaceburg. The unit strength at present is small, being three officers and three other ranks.

3 INFANTRY WORKSHOP

3 Inf Wksp RCEME is located in Hamilton; that is, the name of the unit is located in Hamilton. Major J.M. Atwell, the CO, has had more than his share of tough luck in locating a place to set up shop. For one and a half years all business was conducted from his own business office. Now he has one small lonely desk in the orderly room of 19 Tpt Coy RCASC. His strength at the present time is two officers; an RCOC Stores Officer and himself. This sad tale has, however, a page free from tears and heartbreak, for recently the government either purchased or rented the old Otis-Fensom Elevator Co Ltd building that is situated on Burlington Street. This is now undergoing renovations and will on completion house three units; 19 Tpt Coy RCASC, 3 Inf Div Ord Fd Pk and 3 Inf Wksp RCEME. No completion date has been set as yet but once this accommodation is ready, the unit should have no trouble in recruiting suitable personnel.

6 INFANTRY WORKSHOP

This unit is located in Kingston, Ont. and is commanded by Major P.G. Otten. Present strength stands at 6 officers and 32 other ranks. Their training program is restricted more or less to two sections, vehicles and telecommunications. The vehicle section devotes a good portion of its time to the maintenance of unit vehicles, while the telecomm section has ventured into the complexities of assembling small receivers. All men classified as trained soldiers are in possession of their standing orders for wheeled vehicles. This unit has and continues to use training films as a medium of imparting knowledge to its personnel and each training night is usually planned to start off with an applicable training film, followed by a practical period, based on the film wherever possible. All corporals of this unit are attending the Garrison NCOs Course that is being conducted in Kingston.

Accommodation is limited but satisfactory for training purposes -- the limitations being on the recreational facilities. Due to lack of space, it has not been possible to form either an officers' mess or a sergeants' mess; some space has been used for the setting up of an all ranks' recreational room.

From this unit, two other ranks have joined the Active Force within recent months and one of them has recently been appointed to the Royal Military College at Kingston.

7 INFANTRY WORKSHOP

This unit is located in our Capital City of Ottawa. It is commanded by Major G.T. Burgess and at the last report had a strength of 8 officers (including two LAD officers — 71 and 110) and approximately 130 other ranks. This unit is housed in what was formerly a fire hall, situated on Sussex Street. Once more this accommodation is limited but it does provide the necessary quarters to conduct certain types of training.

Besides having a Christmas party for children of its own personnel, 7 Inf Workshop helped make the festive season brighter for less fortunate children of Ottawa. They spent many hours repairing NS toys gathered by workshop personnel, which were distributed with baskets of food to fifteen very needy families before Christmas.

24 MEDIUM WORKSHOP

24 Med Wksp RCEME under the command of Major D.C. Little is located at St. Lukes Road Barracks in Windsor, Ontario. These barracks are a collection of wartime huts with a barbed wire compound and a garage capable of housing three large trucks and a couple of motorcycles. Many adjustments have been made to these quarters in the last few years and while the unit is not luxuriously appointed, it is comfortable and capable of fulfilling its proper functions. The strength of the unit as of 30 Nov 49 is 10 officers (including two LAD officers — 63 LAD and 64 LAD), three officer cadets and 58 other ranks; 22 of these being

(Continued on Page 15)

24 Med Workshop on

OPERATION 'OJIBWAY'

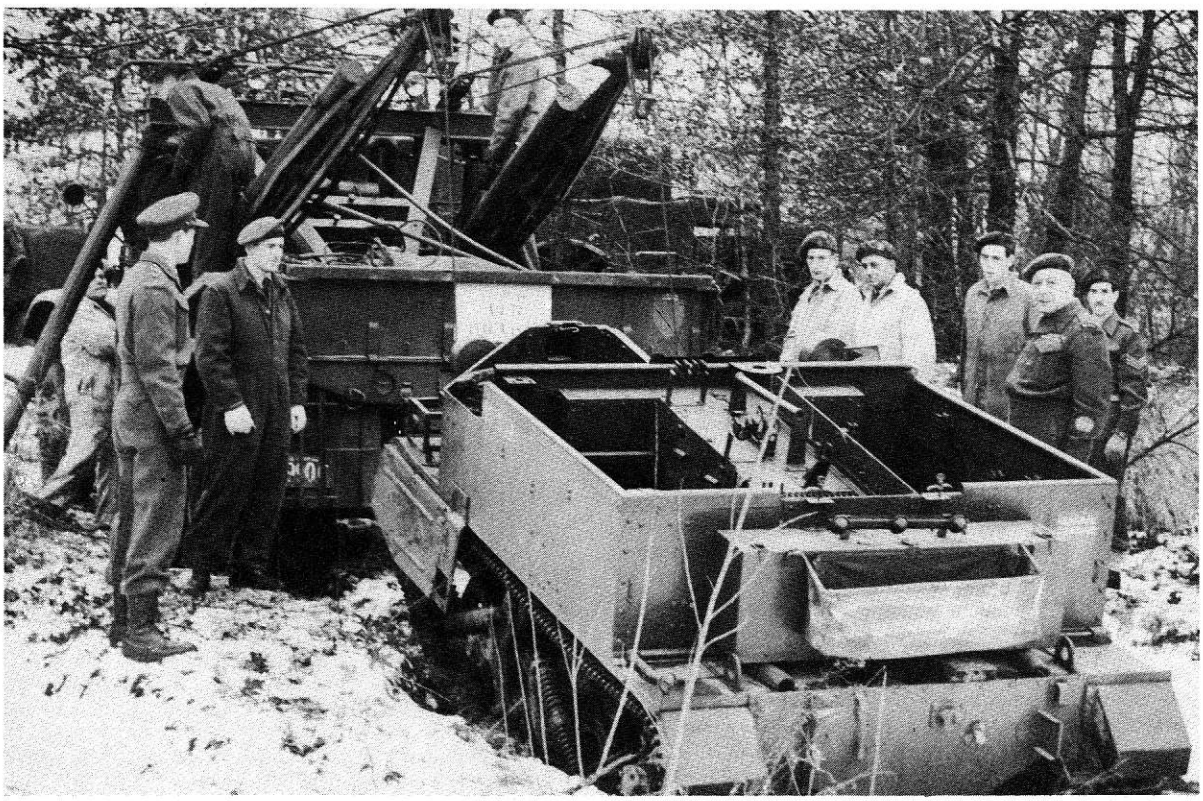
24 Medium Workshop held the first of a series of weekend schemes on 22 Jan, when the unit in convoy set off at 0930 hrs to Ojibway, 15 miles away. All sections carried out allotted training under field conditions; a hot meal was served at noon, and the unit had their vehicles berthed and were dismissed by 1745 hrs, after a very profitable day.

Operations were directed from unit HQ at St. Luke Road Barracks by the OC Major D.C. Little and Lieut A.H. Tupper, telecom officer.

The Unit assemblies for briefing on arrival at Ojibway training area.

(Windsor Daily Star Photos)

Capt E.R. Pomeroy (in bow gunner's seat) and CQMS A.G. Deans, A&T staff, driving M5A1 light tank protection workshop site.



Medium breakdown lifting carrier clear of boulder. Capt J. Brown observing while WO II W.J. Smith (in white coveralls to left of truck) demonstrates.

123 LAD and the KANGAROOS

by WOI J. Tatham, DME

During the early stages of the battle in North-west Europe, operations were carried out more or less to our advantage, up until the time we were held back just beyond Caen. Several attempts were made to break the strong opposition but the enemy held on bitterly.

A decision was made by the High Command to employ an armoured fighting vehicle, preferably tracked, to carry infantry into battle. The tanks, spearhead of the attach, were unable to clear the small arms, machine gun and mortar posts that were often left behind in a tank battle. In some cases these posts, although small, were sufficient to stop or at least to slow down the infantry when operating on foot. This meant the tanks were in the thick of the fighting without support. Ofttimes, due to the lack of accompanying infantry, hard fought for objectives were lost.

The need for protection for the infantry from the start line to the enemy's position was imperative. The answer to this problem was found in the "Kangaroo" (or armoured personnel carrier). It could go anywhere the tank could go, and gave some protection to the infantry (being carried inside) right up close to the objective.

In order to make this dream come true, about seventy M7 (105 m/m Priests) were obtained for infantry protection. These vehicles required a considerable amount of work, mechanically, and had also to be converted to an equipment in which about ten or twelve men could ride.

Several RCEME and REME workshops were amalgamated in a large field to do this conversion work. The 'boss' of the job was Major G.A. Wiggan, with 'Buck' Hargreaves as Workshop Officer. The project was estimated originally as taking several weeks, but under marvellous supervision and cooperation of all personnel employed it was completed in four or five days.

Upon completion of these vehicles, drivers were obtained from either the artillery unit that had the Priests, or from the Armoured Corps reinforcement units and, without time for much organization or training, were rushed into action.

The first taste the enemy had of the Kangaroo was in the Rouve area on the road to Falaise. The experiment was a great success and some of the credit for the destruction hurled upon the enemy in the historic "Falaise Gap" was due to these vehicles and their crews.

Although the writer was not on the LAD attached to these vehicles until later, I might say that we who converted these vehicles, were proud of the fact that we had contributed to the success of their operation.

Now that the Falaise Gap was past and the enemy on the run it was confirmed that the vehicles of the 1st Cdn Armoured Personnel Carrier Squadron were a success, and that we could continue using them for infantry protection. The Kangaroos started 'jumping' on their long trek to the Rhine, covering in their stride such places as LeHavre, Boulogne and Calais, where the fighting was tough and vehicle casualties were heavy. Capt W.T.E. Duncan was OC of the LAD from its first operation until late in the war, with AQMS Ernie Lowe as his 2IC until they reached Antwerp where I replaced Lowe.

We settled for a while in Tilburg where the squadron had retired for regrouping. Here the unit was formed into a regiment and new vehicles and personnel were assembled. The new Ram II was to be the adult Kangaroo, with the turret and all the ammo boxes and racks removed. Although these vehicles (108 of them) were being issued to us supposedly new, it was thought that a complete check should be made on them all, and after a road test and inspection, every vehicle showing the slightest operating defect was put into the shop for repairs.

The shop used by the LAD in Tilburg was a flour mill near the Canal. It was just large enough that by much maneouvring and swearing we could get four tanks in. But although the area around each vehicle was small it was certainly better than working outside as it was now November 44.

With our establishment of thirteen fitters (MT and AFV) we had very good production. Over the 2-month period we were in Tilburg we averaged two complete 100-hour checks per day as well as numerous other jobs done on the tanks and 'B' vehicles. While our fitters were busy on engine work and general repairs, the welders were occupied on welding rear idler brackets as it was found that the holding rivets were stretching and the idler was running out of alignment.

Kangaroos carrying troops on the road from Assen to Groningen.

On top of our normal LAD role, we were forever getting stray requests such as, "Try out HD 30 oil and see how it works in the radial engine for winter use". This operation took three or four days but luckily our fitters were not bothered too much, as Capt Duncan and Capt Rookes (the Tech Adj of the regiment) did the experiment themselves. Another typical request was, "Fix the MO's half-track to make it carry his equipment and stretchers".

Although our stop in Tilburg was two months, it was certainly longer than anyone had ever dreamt. We were expecting to get a call any day to get moving, that the big push was on, but we knew that the vehicles were not in condition to go into action. So every man worked untiringly to ensure perfect vehicle performance when the call came.

In the first week of January, I got orders to take part of the LAD on a small operation at Venray on the Mause River. Out of the 22 tanks that went in on the 'run', seven required repairs and recovery. All the vehicle casualties had hit mines, therefore the tracks were broken and suspension wheels if not blown off were flat and had to be replaced. This work was done within 300 yards of the enemy lines, behind a wood, but fortunately not within enemy sight while working. During this time we dare not make any unnecessary noise, such as running the engine, or heavy hammering. However, careful as we were, we slipped somewhere, because the German 88 m/m air bursts started coming over about six at a time and every ten minutes. In spite of this, the repairs were completed and we moved back to a more comfortable spot and prepared for the return to Tilburg.

Upon our arrival at Tilburg we were told the remainder of the LAD had accompanied the regiment to southern Holland on the Ardennes push. Our orders were to check over our equipment and the tanks and to follow the regiment south. The tanks were taken by RASC transporters to Sittard, and from there we started another operation, for the first time as a regiment.

This operation was carried out under the most difficult conditions; ice, snow, sleet, mined and cratered roads made travelling extremely hazardous and vehicles were continually in trouble. More than sixty of the 106 Ram carriers struck mines, or were knocked out by shell fire, and required repairs.

The LAD was set up in an old blacksmith shop here and although we could not take the vehicles inside we completely assembled our replacement engines or did our 100-hour checks on the engine inside. From the several tanks hit by shell fire we salvaged some engines or components, also suspension parts that were in short supply.

I have mentioned several operations in which the LAD took part, that is, at the 'start line' and also checking when they came back from a 'run', but have omitted to say that during all attacks we were not allowed more than four tanks per squadron LOB (left out

(Continued on Page 28)

Corps Association news

On October 6, 1949, a meeting was called for the purpose of organizing a Maritime Corps Chapter and a Halifax Group of the RCEME Corps Association.

The following officers were unanimously elected for the Maritime Corps Chapter:

Chairman	Major O.B. Berringer
Secty-Treas	Lieut H.G. Bowes

and for the Halifax Group:-

Chairman	Capt A.M. Croft
Vice-Chairman	Lieut A.L. Bowman
Secty-Treas	Lieut H.G. Bowes

The Halifax Group, having reached the required membership of ten, have applied for their charter. The group intends to hold meetings each month, if possible, and notices and reports of meetings are sent to all members and prospective members. By this means it is hoped to increase membership and maintain contact with all members throughout the Maritimes.

* * *

The Niagara Chapter held their second meeting the latter part of November. All members of Toronto Group were invited as guests of the Niagara Chapter. This meeting was held in the form of a dinner gathering at the cafeteria of the Ontario Paper Company at Thorold. Brig G.M. Grant, President of the national Corps Association, was guest speaker. Brig Grant gave a very interesting talk on the activities of the Canadian Industrial Preparedness Association.

After the dinner Col Bruce MacAdam invited the whole gathering to his house for the balance of the evening. A wonderful time was had by all those attending and as this is now to be an annual event we feel sure Bruce will have to hire the local hall to take care of the huge gathering that we feel sure will be there next year.

* * *

The Toronto Group of the Association under the chairmanship of Lt Col F.W. Granston started its year with a social evening held in December. More than one hundred members and their wives enjoyed an opportunity of exchanging reminiscences and indulging in dancing during their less serious moments. The dance was held in aid of the local reserve unit's annual Christmas tree for the children of all ranks, and succeeded in painlessly producing a not inconsiderable assistance to that worthy cause.

The following programme has been laid on for the balance of the year:-

Social Evening	- Friday 20 Jan 50
General Meeting	- February 1950
Social Evening	- Friday March 1950
Annual General Meeting	- April 1950
Annual Dinner	- May 1950

Brig G.M. Grant CBE, President RCEME Corps Association (DPR Photo)

WITHIN SCOPE OF EMPLOYMENT

It is well known that an employee injured while acting "within the scope of his employment" may receive compensation under the State Workmen's Compensation Act. Generally speaking, an employee injured in a fight, not connected with his regular work, with a fellow employee cannot recover compensation. But if he was injured while doing his regular work, he is within the scope of the employment and can recover compensation.

For instance, in Kenny vs Esslinger, 55 Atl. (2d) 554, it was shown that a man named Kenny was employed as a truck and tire maintenance man in the garage. One day Kenny 'kidded' a Mr. Burgoon about the number of employees Burgoon permitted to drink beer. In about five minutes Kenny returned to the garage to put some tools on a bench and he was struck by Burgoon. Kenny fell to the floor and sustained severe injuries. He sued to recover compensation under the State Workmen's Compensation Act. In allowing compensation the higher court said:

"The accident occurred after the altercation as claimant (Kenny) was walking across the garage floor to put some tools on the bench."

Hence, this court held that since Kenny was injured while taking tools to his bench, he was performing work within the scope of his authority when he was struck and injured by a fellow employee.

— Leo T. Parker in TBA News

(**24 MED WORKSHOP** - continued from Page 9)

warrant officers and senior NCOs. Recruits are steadily flowing in and it is the ultimate aim and boast of the unit that theirs will be the first unit in the Reserve Force to reach their full establishment. All members are working towards this end. The average parade attendance is 90% of the total strength, a fact that makes all members very proud. And so they should be, considering that many of the personnel are connected with civilian concerns that work shift hours.

Training includes GMT, Telecommunications, Vehicles, Armament and Ord Stores courses. These are being conducted under the able guidance of unit officers and have produced a 'must attend' attitude in the minds of all personnel. Practically all personnel are qualified for their drivers' standing orders and training schemes have been centered on driving instruction in the past. Displays of equipment in different localities within Windsor have provided competition between the sections of the workshop. As a rule the workshop moves off in convoy, sometimes radio controlled from the headquarters, and when a halt is made, sections endeavor to outdo one another in setting up their equipment in full working order. This has been accomplished in as little as four minutes from the time the halt was called. The 'M', 'D-1' and 'KL' trucks, heavy recovery vehicle and generating trailer are used to good advantage on these schemes and the telecomm section aids in providing communications between the convoy and headquarters. Training schemes are also carried out in conjunction with the Essex Scottish Regiment and the Windsor Regiment (22 Recce) RCAC. These have proved of excellent value.

Recreational activities in the unit are many and the officers and sergeants messes are particularly active. Plans at the present time include a children's Christmas party and a New Year's Eve party in both the officers and sergeants messes.

25 MEDIUM WORKSHOP

Sudbury, the home of the Nickel and Copper industry, is also the home of 25 Med Wksp RCEME. (See photograph.) This unit is commanded by Major D.H. Forster MBE and has a strength of 4 officers, 3 officer cadets and 18 other ranks. The armoury, since occupancy, has undergone a complete 'face lifting', much of this work being completed by the members of the unit. Both messes have furnished their respective quarters and improvisation has been the keynote of their success. The sergeants spray-painted the fluorescent lights in their mess with the Corps colours and the effect is most decorative. Here is an example of their improvisation. An old chiffonier was presented to their unit as a gift, the bottom portion was converted into a sideboard for the sergeants' mess, the large oval mirror from it was first installed in the officers' mess in its original form and was then converted into a coffee table top, mounted on a metal base which allows it to swivel. The top of the chiffonier was converted into a small table top to hold the register in the officers' mess.

Training for the most part has been restricted to GMT, as the unit's requests for training equipment are in the process of being answered. Until the arrival of this equipment, very little technical instruction can be carried out.

(Sudbury Star Photo)

A recruiting campaign is in the formative stages and will be launched at the beginning of the new year, as soon as part of the training equipment is received. Interest among the present personnel is extremely high and no difficulty is foreseen in enlisting additional personnel.

A Hallowe'en Party was staged by both messes and was well attended. These parties served two purposes; first, to provide recreational activity for the Reserve Force personnel and second, to introduce the workshop to the invited civilian guests.

36 HAA WORKSHOP

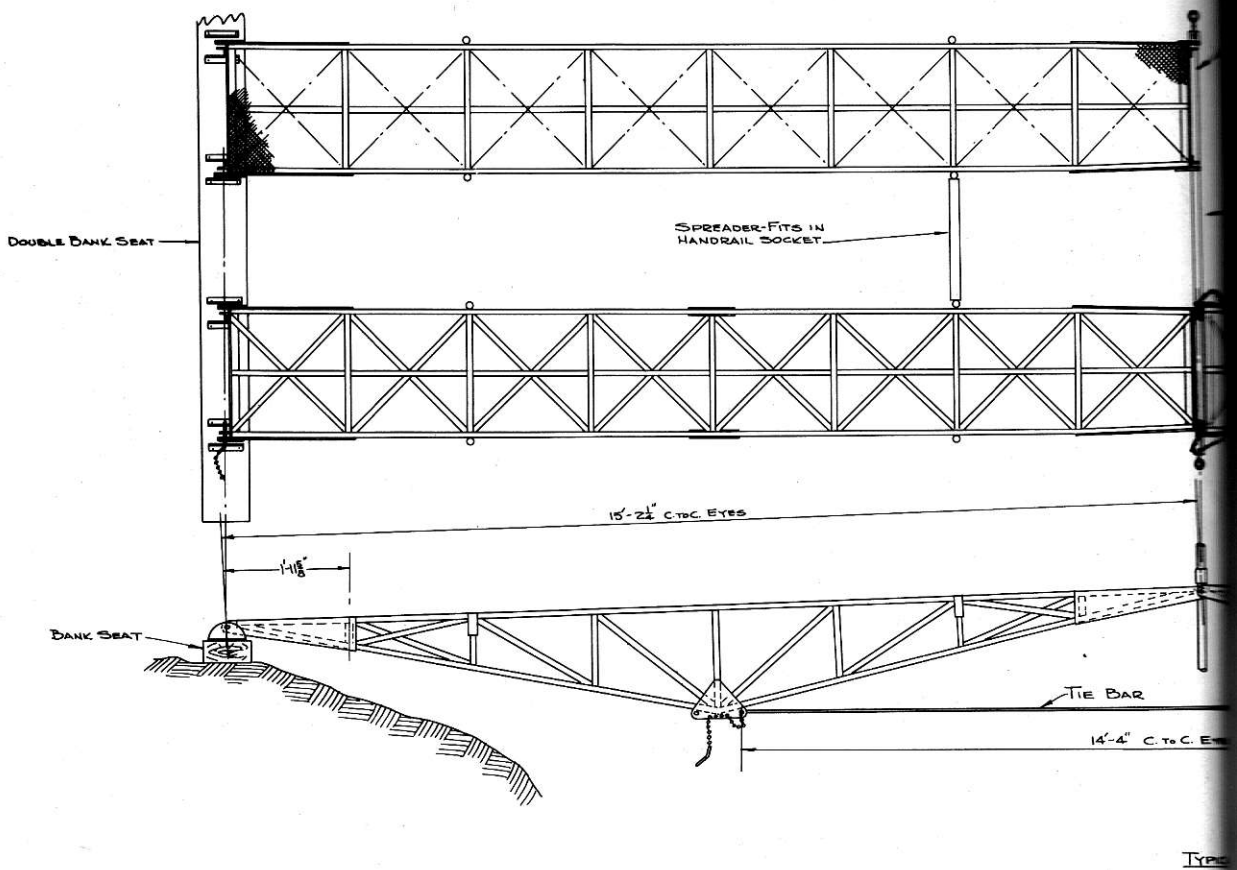
This unit is located in Sault Ste Marie and is commanded by Lieut O.M. Ketola. Their present strength is 1 officer and 18 other ranks; it was previously higher than this, but non-effective personnel have now been weeded out and the unit is anticipating new blood early in the new year.

37 HAA WORKSHOP

Peterborough is the site of this workshop and the unit is commanded by Capt R.P. Asselstine. This unit is in the position, similar to 19 Armd Wksp, Oshawa, of having only one small room in which to operate. It is the hope of all that in the near future suitable accommodation will be found, allowing the unit to expand.

(Continued on Page 28)

THE OLAFSON B



TYPE

During operations in north east Italy, Brigadier J.P.E. Bernatchez, CBE, DSO of the 3rd Canadian Infantry Brigade felt there was a great and urgent need for a light foot bridge for the infantry to cross the numerous canals and rivers between Rimini and up to and past Ravenna in the Po River valley.

About Nov 1944 the brigadier asked his LAD officer, Capt E.A. Olafson MBE, if he would attempt to build a very light bridge for the infantry. Olafson took on the job, got in touch with CREME of 1 Canadian Division who at once delegated 3 Canadian Infantry Brigade Workshop to assist him.

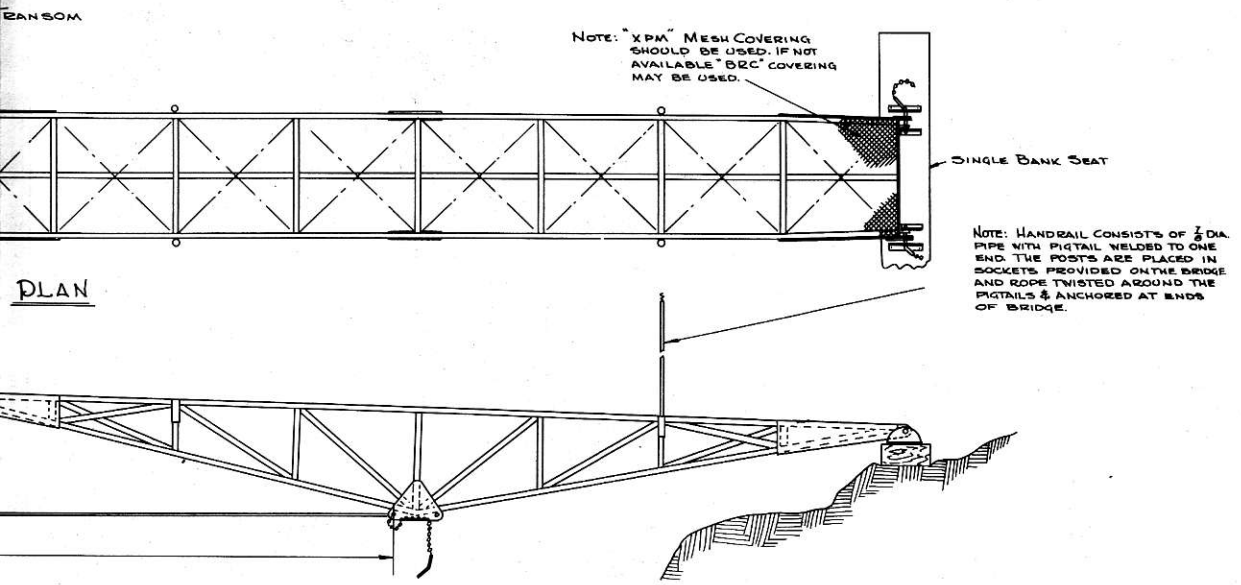
As books and tables for designs were not available, it was decided to make the bridge from half inch steel pipe in sections or spans of fifteen feet. The spans had a strong gusset built on the ends so that they could be pinned and trussed to one another (as shown in drawing) to make a bridge up to 75 feet in length. Each section was tested by placing the ends on blocks and having men stand at two foot intervals across the span.

A workshop of about thirty men was set up on a three eight-hour shift basis and operated for over a month. Although material and welding rods were very difficult to obtain, enough bridging was built to supply each brigade with four sets 75 feet in length.

The required number of sections to give desired span are assembled upside down on ground. Female end of one section is connected to male end of next by means of sheer pins chained to female ends. Tie bars are then hooked up with sheer pins chained to gusset plates.

FANTRY BRIDGE

NOTE: THE ORIGINAL SINGLE FOOT BRIDGE MAY BE SUPPLEMENTED BY A PARALLEL FOOT BRIDGE AS SHOWN HERE, TO MAKE A BRIDGE SUITABLE FOR JEEP CROSSING. DOUBLE BANK SEATS, SPREADERS AND TRANSOMS ARE PROVIDED FOR THE PURPOSE.


TRANSOM
NOTE: "XPM" MESH COVERING SHOULD BE USED. IF NOT AVAILABLE "BRC" COVERING MAY BE USED.
SINGLE BANK SEAT
NOTE: HANDRAIL CONSISTS OF ¾ DIA. PIPE WITH PIGTAIL WELDED TO ONE END. THE POSTS ARE PLACED IN SOCKETS PROVIDED ON THE BRIDGE AND ROPE TWISTED AROUND THE PIGTAILS & ANCHORED AT ENDS OF BRIDGE.
PLAN
ELEVATION
TWO SECTION BRIDGE

The bridge is then turned right side up and bank seats and handrails installed. If necessary to float the bridge across the water, a kapok float may be fastened centrally to it in such a position as to leave about five feet projecting beyond the float to facilitate seating of end on the far bank.

When conditions permit, footing plates and supporting posts may be installed (in pairs) to steady the bridge and take strain off tie bars. Total span should be broken into 30 to 45 ft lengths by means of these supports.

When Jeep bridge is desired a second foot bridge is assembled and launched as above and joined to the first by means of spreaders. Footing plates are then installed. Duck boards should be laid on top of XPM covering to help distribute the load when heavy jeep traffic is anticipated. Supports are always installed at hinge points, and a chain with spring catch on the transom hook is fastened to bridge to prevent it from jumping off the transom hook. The bridge had a matting covering to cut down noise, and a rope railing for safety.

RCEME constructed this bridge rather than the Engineers because of the latter's very heavy commitment of work and they did not have the welders required for this type of work. The bridge proved so satisfactory, that when 1 Canadian Division arrived in Holland in April 1945, another workshop was set up at Hengelo to build the bridge. However, the war ended just as this work got underway.

PROFICIENCY COMPETITION

Some months have now passed since the second annual RCEME proficiency competition took place at Barriefield and we have had an opportunity to sit back and view the whole affair objectively. (Not to be confused with abjectly.)

It was 5 Oct 49 that over a score of RCEME craftsmen descended upon our hallowed seat of learning to test their skills, each determined to surpass all others and bring honour to his command. The day was fresh and sunny, the scene was set with care and at the given signal the momentous struggle was under way.

The DME, strolling about with his cohorts, viewed his minions with pride and engaged himself with visions of new methods and techniques that would be born of the contest. The scene, meanwhile, was rapidly changing, the tranquil uniformity that prevailed with the launching of this effort seemed to be evaporating, yet it was difficult to attribute the cause to any one factor; it was a myriad of little things such as the variation in the layout of tools, work and CAEMEIs on the tels benches — the complete range from orderliness to muddle; the variations in approaches to the rifles and instruments; and the bustle of the motor mechs as they peered up exhaust pipes or down radiators. Then too, echoing through the cavernous hall, was the resonant voices of two Command EMEs in heated discussion — resulting from an accusation that one of them had nefariously advised his standard bearer of the nature of the fault borne by the ailing jeep. One also heard the beat of the mixing paddle as a confused craftsman strove to achieve the correct proportion of plaster of paris for setting a level bubble and ended up with almost enough for the medical boys to set a leg. A busy scene indeed.

The sun was lowering in the west when one by one the victors and the stragglers emerged from the ring — soiled, weary and perhaps not a little perplexed — and plodded their way to more pleasant surroundings and congenial company to quaff of the 'nut brown'.

Then came dinner, presentations, speeches and it was all over for another year — who knows, perhaps indefinitely. The value of the meet is questionable. It would appear that the minimum of interest has been aroused within Commands. It is doubted whether the competitive aspect is given its due — perhaps this phase could be improved by completing all eliminations by 1 May -- a common task being tried by all aspirants of a given trade. Perhaps the 'herring chokers' don't want a trip to upper Canada anyway.

Well boys what are your views? This contributor has mulled it over — if we are missing the point let's hear about it. Why not write a letter to the Editor?

* * * * * * * * * *

Cpl: What can you say to a beautiful girl who's so scary she jumps into the nearest man's arms when she's frightened?
Sgt: Boo.

— Minnesota Technolog

Going places safely

Craftsman J.P. Belanger, SD-105515 of 202 Base Workshop RCEME, Montreal, won the Quebec Command Trophy emblematic of the Command's champion truck driver by out-scoring ten top army drivers from all over the province in the Quebec Command Safe and Skilled Driving Competition held at the Craig Street Armoury 22 September 1949.

Montreal Herald (Arless)

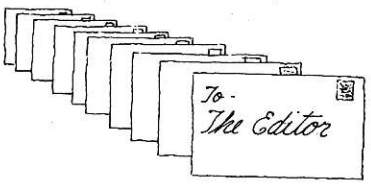
Major General R.O.G. Morton, CBE, GOC Quebec Command, presented the trophy to Cfn Belanger after the competition which was witnessed by hundreds of army officers and men as well as transport officials from civilian concerns.

Cfn Belanger scored a total of 323 points out of a possible 350, and he was 15 points ahead of his closest rival. He has been warmly congratulated by 202 Base Workshop officers and personnel for his splendid showing in bringing the honor of the trophy to this Unit.

The contest consisted of backing, parking and threading a loaded Dodge two ton 4 x 2 truck equipped with tarpaulin through the rigorous lanes and barriers erected to test a driver's spot judgment; also, subjected to other subordinate tests such as appearance, examinations on fire fighting, driving information and equipment defect tests.

Cfn Belanger has been with 202 Base Workshop since July 1947 when he re-enlisted. Previously, he served five years in the United Kingdom and on the continent from 1940 to 1945 as a driver mech.

Letters



Colonel Boehm,
The Editor-in-Chief,
RCEME Quarterly:

I would be greatly obliged if you would convey to all ranks of the Royal Canadian Electrical and Mechanical Engineers my very best wishes, as Honorary Colonel Commandant, for the New Year. I hope to return to Canada early in 1950 and that therefore I may have a better opportunity during the year to visit at least some of the detachments. With kindest personel regards.

General McNaughton.

81 Grove St.,
Barrie, Ontario.
December 20, 1949.

The Editor RCEME Quarterly:

I wish to compliment you on your publication which not only keeps me posted on the activities of the Corps, but passes on to me its choice information.

When I was moved to Barrie from Toronto, I became affiliated with the 135th Battery of the 45th Anti-Tank Regiment RCA, which is the only local unit. I joined as Transport Officer and now have been promoted to the post of Technical Adjutant of the Regiment. Although I have transferred to RCA, I still jealously guard my association with RCEME.

Please continue to include my name on your mailing list.

Yours very truly,
R.K. Pile, Lieut,
Ex EME (Reserve Force).

CANADIAN TANKS (continued from Page 6

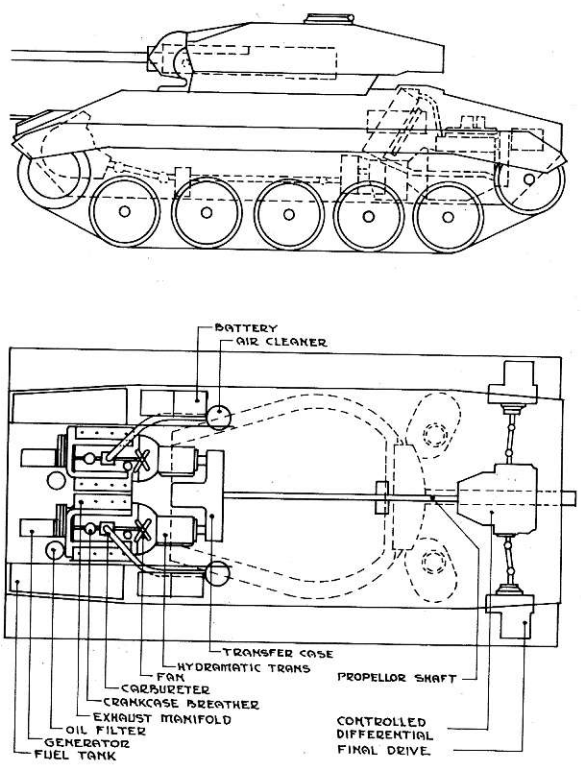
as easy to drive as any passenger car.

Since the pre-selection of gears in hydraulic systems is based on optimum engine speed and on the power demand, the engine is running under more or less ideal operating conditions all the time, with a consequent beneficial effect on its life. Further, clutch troubles are non-existent, since there is no clutch. Mechanical failures on the hydramatic units have proven negligibly small. It is suggested that a straight mechanical connection between the tank engine and the tracks will not be accepted practice in the future. The connection will be either hydraulic or electric.

There was a medium tank in the US Army which was powered by a 500 hp Ford V8 tank engine, directly coupled to a DC 1400V generator. This in turn was electrically coupled to two 700/1400V driving motors. The tank had dual control, and could be "turned on a dime". This gasoline-electric tank was not extensively used, and it cannot be denied that it was to a certain extent an electrician's dream — or nightmare. The Germans however were quite sold on the use of electrical transmission, and considered it to be the best way to obtain reasonably easy and accurate steering, especially for heavy tanks. Their 184 ton monster (the "Mouse") which was manufactured in prototype only, had electric drive.

In conclusion, let it be said that the above few notes are but a nibble at the fringe of a large subject which has occupied the brains and energy of many ingenious people. It is hoped, however, that they will show that many diverse factors influence the choice of equipment in wartime and the result, through force of circumstances, is seldom if ever ideal.

Condensed by the author from a paper presented by him to the Peterborough Branch of the Engineering Institute of Canada at a meeting held late in 1945



The Chaffee (M24) Light Tank

THE NEW BINDERS

by 'Pick'

In AHQ there's not much to do,
They just sit around and dream,
And whiling away the hours so gay,
This thought struck Colonel Boehm.

The RCEME Corps don't work any more,
In fact, they're getting lazy.
So I'll give them a job, that'll really play hob,
In fact, it'll drive them crazy.

Now the poor RCEME Joes, are counting their woes,
They've sure got the screaming meemies.
The job that he gave, sure made them rave,
They have to amend the CAEMEIs.

To add to the sighs that they send to the skies,
There stands the grim reminders,
In colors bold, of red and gold,
Hundreds of brand new binders.

The sobs that drooled in The RCEME School
Like the end of a civic election,
Couldn't be compared to the racket that flared,
In the once happy Armament Section.

Here, the only thought was to chuck the lot,
They just had to get rid of this prize,
From the awful gloom that filled these rooms,
You could hear these mournful cries.

"I want a pass", "I've got a class",
"We've duties, one and all".
To duck this stew, some of this crew
Even beat it to Montreal.

The die was cast, and to avoid the blast
Everyone pitched right in.
Don, Eddy and Cy, Ossie and I,
Boy, what an awful din.

Instruction two of issue two,
Boy, ain't we got fun.
Hells Bells, where's all the Tels,
This cancels Issue One.

Just hear us shout "Tear that one out,
This goes in Armament 'J',
Like heck it does, this cancels that,
So put it in Instruments 'A'."

"Put this in the file and gimme that pile,
And throw those on the floor.
To heck with youse, those Nine Point Twos
All go out the door."

"What did you say about Instruments 'A',
And how about Vehicles 'B'.
Well! Well! there goes the bell,
Let's all break off for tea."

We're back again wracking our brains,
What cancels Issue Four?
When old Don yells, "I've finished Tels",
And falls over on the floor.

In Cy vaults with the smelling salts
And Eddy is right on the jump,
From the floor Don groans in mournful tones,
"Boy am I a Wump".

"I've worked all day on Telecom 'A'
And it really seems like years.
I've got all mixed and in a heck of a fix,
Now they are all in with Engineers".

Yes, these are the boys, once full of joys,
They used to be lots of fun,
In their country's service, they're getting nervous,
Breakdowns, three star, Mark One.

It's pull and insert, 'til you're almost inert
And the paper piles up on the floor.
A go with the broom would fix up this room,
If the janitor could get in the door.

But the day will come, when this job is done
And the CAEMEIs A to Z
Will be placed in the rack, and a prettier stack
Of books you'll never see.

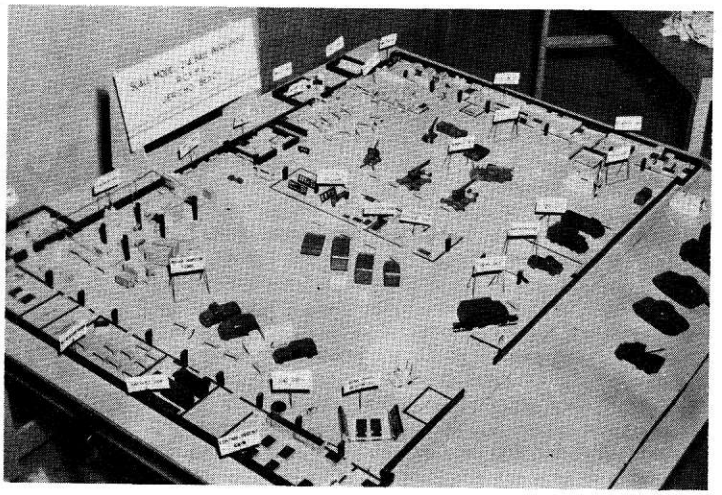
And I'll bet dough, that's when our CO
Will shout with might and main,
"Get back to your books, you half-baked schnooks,
We're changing CAEMEIs again"

Workshop Uses Scale Model

Of considerable use in the workshop reorganization of 214 Base Workshop at Vancouver, BC, has been the scale model of the shop pictured here. In addition to a scale model of the workshop equipment itself there are models of the various equipments that the workshop receives in for repair.

All benches, jigs, sub shop outlines and major machine tools can be picked up and moved at will so any contemplated changes can be tried out first to avoid mistakes and wasted effort.

The scale used is 1/4 inch to a foot and considerable care was spent in following it closely. Wood was the principal material used, though others that went into it include paper clips, nails, wire in various sizes, sheet tin, necklace chain, tacks and washers. Paint and some imagination serves to simulate the various parts of machines and enables one to identify the different components easily.



The whole thing was turned out in ten days (plus a few evenings and a week-end) of concentrated effort by Cfn Bill Putman from the instrument shop. Over three hundred items make up the finished model which is no mean effort when one examines the workmanship of the individual pieces. Although only a few months old, the model is already a bit out of date — awaiting the return of Cfn Putman from a GMT course to catch up on the changes since then.

Power tools in the carpenter shop were used to advantage, and painting — the most tedious job of the project — had to be well planned to get all the various colors on any one piece and allow time for drying between each. The machine shop involved the most work due to the variety of machines and their complicated shapes.

The job was hurried to completion to allow it to be displayed at the Pacific National Exhibition as part of the RCEME exhibit in August of this year.

A number of people were surprised to learn there was such a well equipped army shop in Vancouver with such a variety of different trades represented under one roof.

214 Workshop was originally an RCAF hangar of high, flat roof construction, with the only roof supports midway across the long dimension. Lean-to shops abut the north and south ends and tool crib, tech stores office and more recently, the control office are grouped around the center roof support. Changes during the past summer and fall involve a complete overhaul of the engine rebuilding bay; the removal of the electrical shop to a larger and more dust free location near the battery shop; the locating of the control office centrally in the main shop and the moving of the telecomm cage from the main floor into the tels shop.

RCEME TO THE RESCUE

An excellent example of the versatility expected of RCEME craftsmen occurred at No. 2 Coy, Malton, recently, when the Medical Corps at Toronto Military Hospital requested the fabrication of a special head-rest to be used in the operation on a soldier who had broken his neck.

The operation called for the grafting of bone from the soldier's heel to a position at the base of his neck. This operation was long and tedious, and the soldier, lying on his stomach, had to have his head supported in such a manner as to permit easy access for the anaesthetic mask, so as not to hinder natural breathing, and to provide a suitable support slightly lower than body resting position, to enable the surgeon to operate at the base of the neck.

In record time designs were taken by Major J.S. Kitto and Capt H.L.M. King, blueprints drawn up, and the job of construction assigned to Cfn J.C. Pegg, a Machinist (Metal) Group I.

The 'head-rest' itself was made of aluminum, annealled and hammered into shape. This was rivetted to an adjustable spring-loaded ball joint assembly made entirely by Cfn Pegg in the workshop, with the exception of the spring which was a Chev valve spring cut to proper size. Welded to the ball joint assembly was a steel pin which was made to slide up and down a bracket, the bracket in turn being bolted to the operating table.

Once again RCEME has proven its worth in coming to the rescue and much credit is due to Cfn Pegg for the speed and quality of his workmanship. (Incidentally, the operation was very successful and the soldier is well on the way to recovery.)

HORSEPOWER

by Capt K.L. Coupland

Horsepower, as practically all RCEME 'types' know, is not the straining at the collar of our esteemed four-legged friend, but a definite unit of the rate of doing work. We call this measure horsepower, but is it not odd, in a world of electricity, atomic power, and supersonic planes, that we should still think of power in terms of horses?

The present-day buyer of a 10-hp engine, or a 1000-hp electric motor, knows just what work he can expect from his investment. This definite, measurable guarantee is essential to modern industrial practice. But why does the buyer specify his engine or motor by horsepower and how does he know what he is getting? For the answer we turn to the history of the horse and the steam engine.

Lost somewhere in the mists of antiquity is the record of the first man who enlarged his own power by harnessing an animal. But wherever it was, it marked a milestone in our industrial age. By multiplying his own muscular power, man achieved a first long step to greater productivity.

Among the animals that have been used for power are the horse, camel, elephant, dog and ox. Why then do we not use, say 'oxpower' instead of horsepower for the rate of doing work? The reason lies mostly in the evolution of the horse — a grass-powered engine. Over a period of millions of years, according to geologists, it went through a specialized change in structure to adopt itself for survival by a remarkable combination of power and speed.

Enduring, docile, and streamlined for work the horse in harness was a natural choice for pulling loads and powering primitive mills. So when James Watt, in 1780, first put steam effectively in harness, he had only to look around him to see what power his engines would replace.

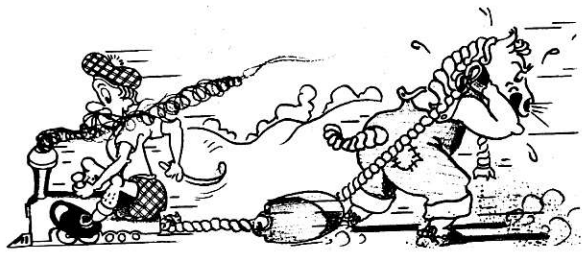
As long as Watt's first units were direct-connected to plunger pumps for raising water from mines it was sufficient to rate them simply by cylinder diameter, length and number of strokes. This could be translated directly into pumping output. But when the engine spun a wheel and delivered rotative power it became of little use to tell the user the cylinder size.

A new method to express power had to be devised, and the inventive Watt quickly met the situation. To guide him he had information on how many horses could do the work his engine must do. Thus the engine's capacity could be expressed nicely in terms of the number of horses it would replace.

Enthusiastic, like most inventors, James Watt selected no ordinary horses for his horsepower standard. Rather, he experimented with the sleek strong Percherons drawing London's heavily laden brewer's wagons. Having them pull a variety of weights up out of a well over a roller with little friction, he first figured that a horse could raise 180 lbs when moving at 180 feet per minute (about 8mph). This gave 180 x 180 or 32,400 ft-lb per min. Later, in 1783, after further experiments, he simply evened the figure to 33,000, and in the Edinburgh Review, for January, 1809, the standard of horsepower was defined for the first time. It was formally stated as the work done in raising 33,000 lbs one foot in one minute.

Although it was known that a horse cannot work continuously at the standard so set, Watt's figure has never been modified. It is commonly understood that this standard was never questioned from that date onwards, but an examination of technical literature of that period shows that this was not the case. The principal reason for this of course was that various authorities of the time had different opinions of the power of a horse. Nevertheless, Watt's figure seems to have persisted, and is the standard in use today.

Since Watt's time the power of steam has been vastly enlarged and made incomparably more adaptable and useful by conversion to the power of electricity. Electric motors have the unique advantage of providing concentrated rotative power at the job in economical, compact, easily-installed, and adaptable form in any size or speed.



For example, say, a motor delivers 1000 hp at 3550 rpm. To do this, the motor must exert a continuous turning effort, or torque, of $\frac{33{,}000 \times hp}{2\pi \times rpm}$ or 1480 ft-lb.

Matched with the motor in a tug of war, one of James Watt's powerful brewery horses might momentarily equal this pull. But Watt in his most inspired moments could not have dreamed how the concentrated forces of electromagnetism could be made to whirl this torque at 60 rps to produce the power of a thousand horses.

(Material for this article was obtained from an article edited by J.J. Jaklitsch, Jr., in "Mechanical Engineering" for May and August, 1949.)

CORROSION

ENGINE CYLINDER CORROSION

Cause

Much of engine cylinder deterioration labelled wear includes a large corrosion factor.

Corrosive influences include acids originating in sulfur compounds in fuel, oil, or air; bromine compounds from antiknock fluids; and such corrosive agents as acetic and formic acids formed by incomplete combustion. But there is much more of ordinary carbon dioxide, a principal combustion product, than the other substances. It is sufficiently corrosive to account for the damage experienced. The other agents may mainly influence the action of carbonic acid.

Most engineers tend to underestimate the corrosive power of carbon dioxide in solution. An investigation of corrosion by water saturated with various carbon dioxide and air mixtures at temperatures from 160 to 250°F, showed: (1) Initial corrosion rates of iron may reach 0.33 inch penetration per year. (2) Corrosion can proceed rapidly even in the absence of oxygen. (3) Corrosion rates decrease with time, evidently due to formation of adherent protective corrosion products.

With regard to the last item, it seems likely that continual abrasion of the cylinder surfaces by piston ring travel will remove protective corrosion products as fast as they form. Consequently the high rates of attack observed in short test periods probably will prevail.

Additionally, presence of other compounds in the corrosive condensate — such as sulfurous and organic acids — may serve chemically to destroy protective carbonate corrosion products, accelerating corrosion in this indirect way.

Cylinder surface temperatures below the dew point of combustion gas moisture induce wear. This accounts for the greater corrosive wear in engines that start and stop frequently — especially in cold weather. It also explains the benefits from cooling system adjustments to keep upper cylinder walls (where corrosive compounds occur) above the dew point, even under adverse operating conditions.

Other factors that influence corrosive wear include the lubrication system, protective qualities of the lubricant, and piston rings functioning. Nature of the fuel and richness of the fuel-air mixture probably affect the way the fuel burns, and determine both operating temperatures of cylinder walls and how long they remain at a corrosive temperature.

Table 1—Comparative Resistance of Ni-Resist and Cast Iron to Corrosion by Chemicals Encountered in Exhaust Condensate

Corrosive Medium	Temperature	Duration of Test	Rates of Corrosion in inches per year	
			Ni-Resist	Cast Iron
Mixed Acetic and Formic Acid Vapors and Steam	212–220 F.	150 hr	0.026	0.142
Water Saturated with Carbon Dioxide	60 F.	.....	0.0017	0.027
Sulfuric Acid 0.1%	200 F.	166 days	0.023	0.067
Sulfuric Acid 5%	60 F.	.....	0.006	1.23
Hydrochloric Acid 1.8%	60 F.	.....	0.012	1.07
Wet Exhaust Fumes & Condensate from Gasoline Engines	.....	99 days	0.012	....

Table 2—Comparative Service Records of Ni-Resist and Other Cylinder Materials

Service	Average Cylinder Wear—Inches			Water Side Corrosion	
	Ni-Resist	Cast Iron	Chrome-Plated Cast Iron	Ni-Resist	Cast Iron
1. Diesel engine in heavy-duty truck hauling ore from pit	0.0036[a]	.....	0.0027[a]	None	Occasional Perforation
2. Diesel engine in heavy-duty truck in West Coast road service	0.00015[b]	0.0015[b]	.....	Slight Pitting	Occasional Perforation
3. Taxicab and light city bus service with Ni-Resist in ser in grey iron block	1[c]	19[c]	.....	.....	.....
4. Light-duty high-speed aircooled engine with Ni-Resist liner in aluminum block	0.00025[a]	.....	.....	.....	.....

[a] per 1000 hr [b] per 10,000 miles [c] relative values

Remedy

A most effective way of reducing corrosive wear is to improve corrosion resistance of the cylinder material.

Adding small amounts of nickel, chromium, copper, and molybdenum to cylinder irons produces moderate improvements. Big gains come from switching to the many times more resistant austenistic cast irons, of which Ni-Resist is the most common. Such corrosion-resisting austenistic irons could be used as inserts for those cylinder parts near the top of piston travel, where corrosive forces prevail.

(continued on next page)

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Table 1 shows the relative performance of Ni-Resist and cast iron in corrosive media believed to corrode cylinders.

Corrosion-resistant materials for cylinders also must provide desirable frictional properties. This is no barrier to use of austenistic cast irons. They benefit from both a graphitic structure, similar to cast iron, and work-hardening characteristics of the austenistic matrix; it makes possible surfaces with excellent mechanical as well as corrosive-wear resistance.

This combination of properties shows up in excellent service records. They are most striking in service with frequent starts and stops and which extends to sustained heavy-load conditions, as in long-haul trucking. Table 2 gives typical service records.

Chrome plating advantages in extending cylinder life come largely from the added corrosion resistance as well as extra hardness and good frictional properties. Corrosive agents, that may penetrate chrome plating and undermine it by corroding the iron beneath, may be more important than mechanical factors in determining useful life of chrome plated cylinders.

CYLINDER LINER CORROSION

Cause

Corrosion of the water side of cylinder liners may become serious in diesel engines, although ordinarily it is not a problem in gasoline engines. Most troublesome corrosion of this sort is highly localized and looks like that in the accompanying cut. The photograph at left represents cast iron after vibratory cavitation erosion test in salt water; the one at right is a cast-iron diesel cylinder after service with salt water as the cooling medium.

Similarity of this damage to that produced in accelerated cavitation erosion tests by the vibratory method suggests this theory: Vibration of the cylinder walls in contact with the cooling water may cause this damage — just as vibration of laboratory cavitation testing apparatus produces damage practically identical to that on cylinder liners.

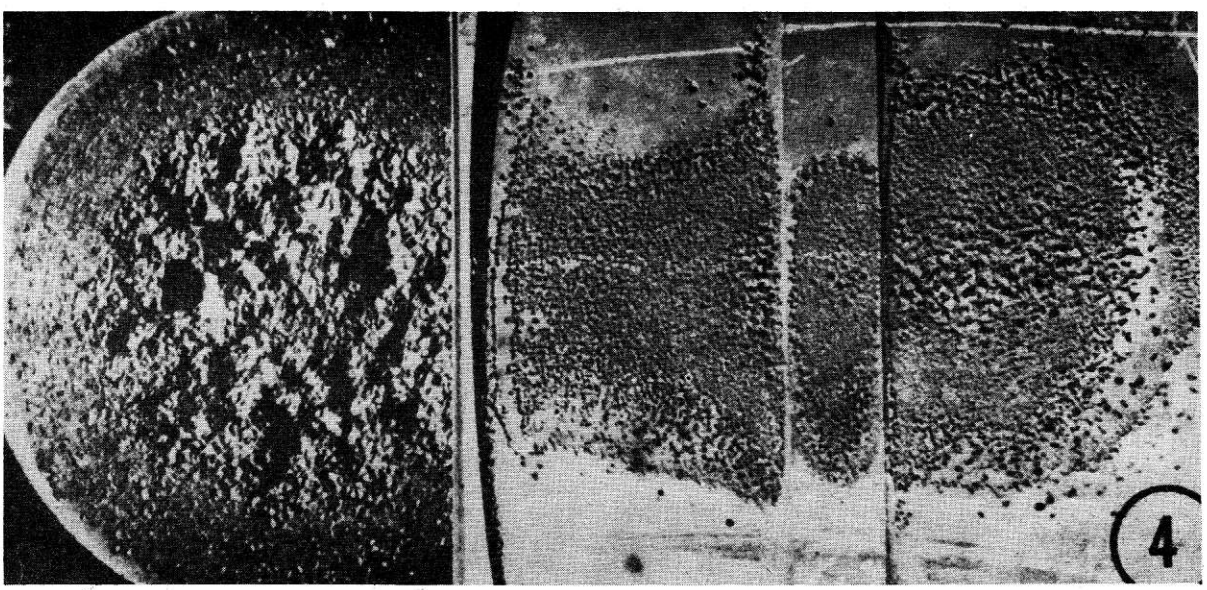
In addition to the cavitation erosion type of deterioration, cylinder liners occasionally are subjected to severe localized corrosion within any crevices that may exist in water spaces. Such crevices may form where two pieces of metal rest on each other — like supporting ribs between jackets and cylinders. Mechanism of this damage involves an oxygen concentration cell, or differential aeration cell, in which the surfaces with the crevice that are shielded from free access to oxygen becomes anodic to surrounding freely exposed metal.

Remedy

If vibratory cavitation erosion actually is a major factor in this peculiar cylinder liner deterioration, then these steps should be helpful in treating it: (1) Check the mechanical design to minimize vibration by stiffening or supporting other members that will dampen out harmful vibrations. (2) Keep cooling water temperature and pressure at as high a level as practical. (3) Introduce air bubbles into the cooling system to cushion the cavitation blows. (4) Reduce or eliminate the corrosion phase of cavitation erosion by (a) using more corrosion-resistant liners and (b) using plenty of chromate inhibitor.

Chromate inhibitors prove quite effective in preventing corrosion or erosion of this type. The concentration required is from 2000 to 5000 parts per million, with the water usually being adjusted to a pH between 8 and 9. Some inhibitors are effective at a pH of 7, considered more desirable than the higher pH with aluminum in the system.

Use of chromates must start as soon as the engine is put into service and proper concentration maintained at all times. Once deep pits or fissures pit the



iron surface, effective corrosion inhibition at bases of such pits and fissures becomes difficult.

These usual passivating inhibitors cannot stop severe localized corrosion within crevices, since they cannot reach the surfaces requiring protection. They may even promote corrosion by increasing the potential difference between the shielded and freely exposed surfaces. Best solution to this problem is either to eliminate such crevices if possible, or to use caulking compounds that seal them thoroughly. Protective coatings also might be applied in the critical areas.

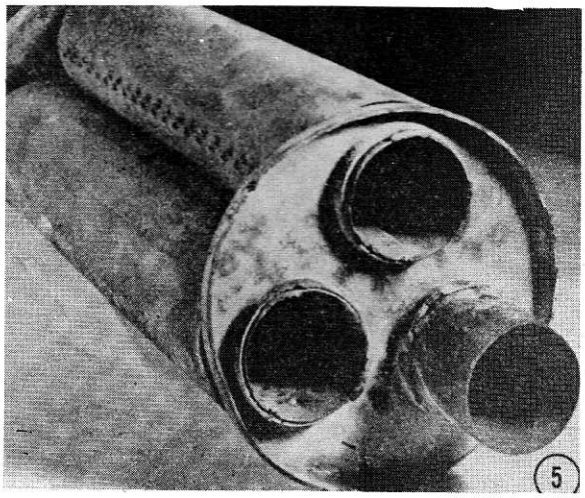
MUFFLER AND TAIL PIPE CORROSION

Cause

Corrosion inside mufflers and tail pipes come from the same causes that make for corrosive wear of upper cylinder surfaces. Chief differences are: (1) Muffler or tailpipe temperatures will be lower than in a cylinder so that condensation will occur more often and for longer periods. (2) More opportunity exists for corrosive condensates to collect or accumulate in a muffler. (3) Since erosive forces in the muffler are less severe, protective corrosion-product films may have a better chance to form and to last.

Mufflers corrode severely and rapidly most often in cars run long enough to form corrosive condensates, but run too short for above-dew point temperature to evaporate them. Cars used by doctors, public utilities, and those used for short shopping trips induce such conditions. In normal car use, temperatures high enough to destroy muffler or tail pipes by oxidation or scaling occur infrequently.

Corrosion from the outside as well as from within attacks mufflers and tail pipes. Car use will determine which effect will predominate. Operation keeping both inner and outer surfaces dry will minimize corrosion. Where temperatures are high enough to keep inner surfaces dry, but outer surfaces merely warm and not dry, the higher temperature will accelerate outside corrosion. Where inner and outer surfaces are wet often, two-directional attack of the steel will minimize its life.



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Remedy

The engineer has less opportunity to prevent condensation in mufflers than he has to prevent condensation in cylinders since conditions of use chiefly determine muffler operating temperatures. But he should direct his design toward elimination of condensates.

The design and construction provide minimum opportunity for condensate to collect, maximum opportunity for its removal by both evaporation and entrainment in the exhaust gas stream.

From the materials and coating approach, several possibilities present themselves.

First, highly corrosive-resistant materials, such as Inconel and stainless steel, will eliminate muffler and tail pipe corrosion problems. For example, Fig 5 shows the Inconel interior parts of a bus muffler after 179,000 miles of service, and they were as good as new. During that time it had three outer shells — one of steel and two of aluminum-coated steel.

Doubling steel thickness will double the life of ordinary steel mufflers. This procedure has the advantage of introducing no new fabrication or joining problems. And steels alloyed with small amounts of nickel, chromium, and copper are superior to carbon steels.

Steel coated with zinc will last a little longer, depending on the zinc thickness. Same is true of lead-tin alloy coatings. Steel hot-dipped in aluminum or aluminized is about twice as durable as bare steel. A nickel-zinc coating — carronizing — approaches the aluminized treatment. While vitreous enamel coatings are highly protective, their application calls for special care in muffler design and fabrication.

BODY STEEL CORROSION

Cause

Most serious car body corrosion proceeds from underneath or inside the exterior surface. Reason: these surfaces get less attention from the owner. They are kept wet longer by splash and clinging mud, which retain and concentrate corrosive substances. Salt on roads and steel composition also influence corrosion rate of body steels.

Considerable confusion exists on effect of sodium or calcium chloride sprinkled on roads to melt ice or lay dust. For example, tests with sodium chloride solutions — ranging from pure water to brine — yield greatest corrosion of bare steel with very small salt percentages. And pure water is more corrosive than all salt concentrations above 1 or 2%.

Explanation for this is that solubility of oxygen in sodium chloride solutions decrease as the salt concentration increases. Lack of oxygen in more concentrated solutions more than compensates for corrosion-aggravating effect of the chloride ions.

This reveals why cars, driven in areas where roads are never salt treated, corrode almost as much as those in regions treated regularly.

Apparently humidity of the atmosphere where the car is kept counts more than salt on roads in determining extent of underbody corrosion. But salt adhering to the car may have an indirect adverse affect by keeping the metal moist through its hygroscopic properties.

Steel composition also can accelerate body cor-

rosion. Rimming steels, used because of forming and drawing characteristics, may contain an unfavorably high ratio of sulfur to copper or nickel content. This lowers the steel's atmospheric corrosion resistance.

Additionally, certain components not requiring severe forming or drawing operations may be made of commercial quality rather than deep-drawing quality sheets. Chance of finding an unfavorable composition from the corrosion standpoint is greater in these parts. Perhaps this explains why parts in this class are particularly susceptible to corrosion.

Electrical currents for lighting, carried by the car body, also may accelerate corrosion. Trouble from this source stems from an interrupted electrical connection between two adjoining surfaces. Also, if the joint has a high enough resistance to force the current to leave the metal and flow around the joint through a moisture film, corrosion will set in on the side where the current leaves the metal. It might blister the joint by forming alkali on the other side.

Remedy

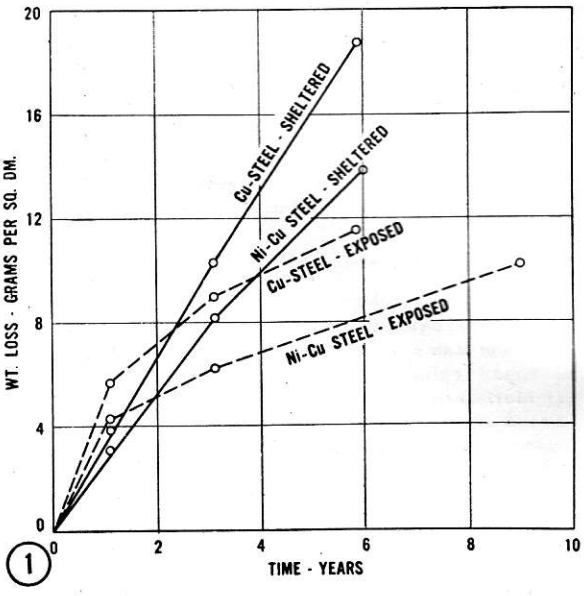
Quick and thorough drying is the most direct way of nipping underbody corrosion in the bud. It also affects the protective value of steel rust films.

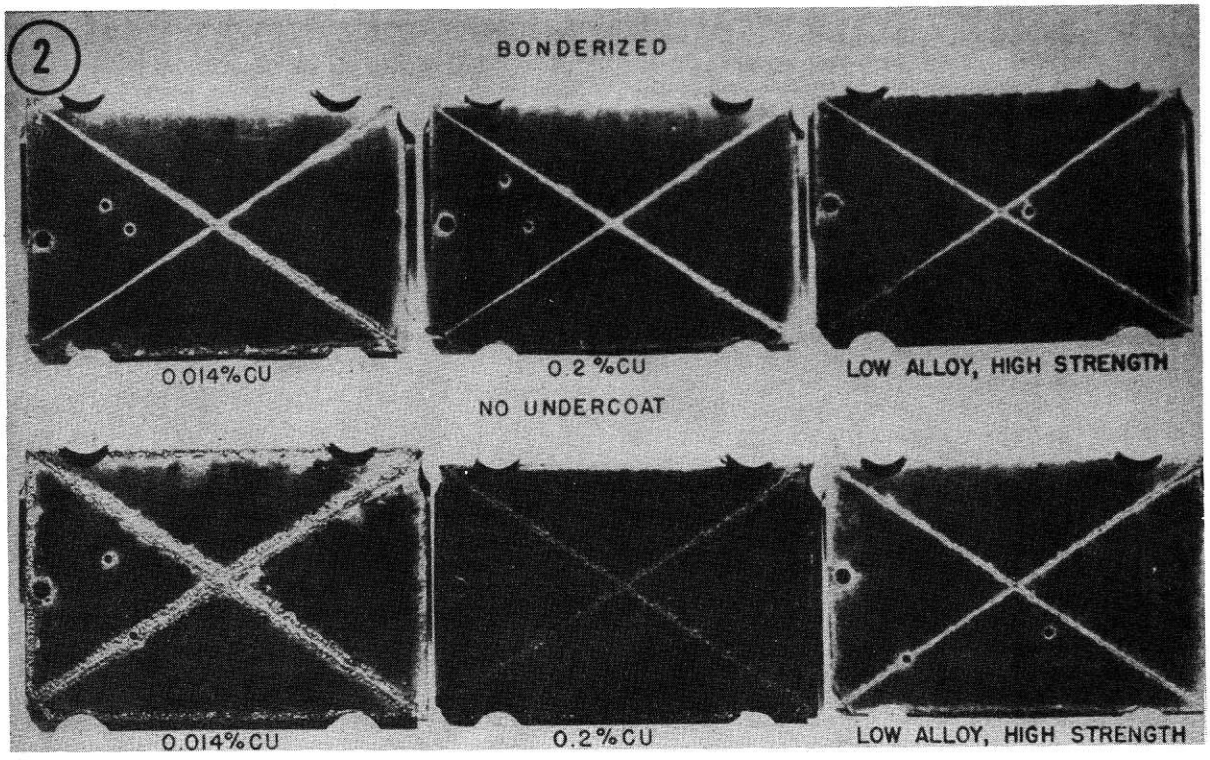
Tests emphasize this point. Speciments exposed in the shade under a partial shelter corrode more than those boldly exposed to rain and sun. This difference increases with duration of exposure, reflecting the greater protective value of rust that has a chance to dry. Fig 1 illustrates this.

Car underbodies should be designed with quick drying in mind. Such controlled underbody ventilation could include air channels and guiding vanes to direct warm drying air from under the hood to surfaces in need of the drying effect. Also effective are fiber-reinforced asphaltic coatings on underbodies, if applied properly.

Efforts are being made to relieve the possible

EFFECT OF SHELTER ON SPECIMENS EXPOSED VERTICALLY AT BAYONNE





corrosive effects of salts used for road treatment by adding corrosion inhibitors to them, especially polyphosphates and chromates. But car users can help themselves most by keeping or parking their cars where they will dry quickly, and by washing them often enough to get rid of accretions that may accelerate corrosion. Danger of accelerated corrosion from salts is not great enough to recommend discontinuance of accident-preventive treatment.

On the steel composition side, corrosion resistance could be improved by using small amounts of copper to overcome sulfur's adverse effects. Desirability of using steel with a 0.05% minimum copper content was confirmed by a survey which showed that 90% of specimens of severely corroded car body parts contained less than this amount of copper. The investigation also disclosed that corrosion at its worst came from a low copper content combined with high sulfur content in parts not severely formed, but used in corrosive localities — such as rocker panels.

A 0.05% copper content provides a barely satisfactory corrosion resistance level. For corrosive environments, sulfur content of steel containing the minimum copper should be held under 0.04%.

Steel's corrosion resistance improved by raising the copper content to about 0.25%, as in ordinary copper steel, and by adding larger amounts of nickel or chromium, as in common low-alloy high-strength steels. Combinations of alloys — copper and nickel — in amounts not much greater than current residual percentages might be effective. It could be done with little additional cost and without sacrificing working characteristics. Such steels are under investigation, with preliminary results encouraging.

Even under the mask of a body finish the corrosion resistance of the steel base shows up. In tests now underway in the marine atmosphere at Kure Beach, NC, a typical body finish was applied to steels of different composition, ranging from a very low copper content to two typical low-alloy high-strength steels. Half the specimens were given a commercial bonderizing pretreatment before painting; the balance were coated with a primer and top coats without the phosphate undercoat.

Fig 2 shows effects of both steel composition and phosphate treatment. It illustrates the conditions of the scribed specimens after exposure of about 2 months, 80 ft from the ocean. These results point up the protective values of desirable steel composition and bonderizing. Probably optimum results stem from use of phosphate treatment on a mildly alloyed steel.

Car body corrosion from stray currents can be remedied by providing a metallic electrical bond around any insulated joints.

(Based on paper "Corrosion Problems of the Automotive Engineer" by F.L. LaQue and E.J. Hergenroether, as reported in the SAE Journal of August 1949.)

THAT TERREBONNE FIRE AGAIN

During August this unit was called upon to assist in forest fire fighting in the Terrebonne area, approximately forty miles north of Montreal, embracing considerable DND property comprising ammunition storage and proving grounds.

The first call was received at 2200 hours on 20 Aug for a tank transporter to convey bulldozers to the scene of the fire. This transport remained in the fire area for seven days shuttling bulldozers from point to point as required.

A stand-to of all military personnel in the Longue Pointe Area was ordered at 0800 hrs on 22 Aug and the RCEME Coy left for the fire at 1300 hrs on 23 Aug and remained in action until 1645 hours on 25 Aug. This left only essential supervisory personnel to maintain services in the workshop. On 22 Aug all wire communications in the area went out and this unit was called upon to set up a radio link. The Longue Pointe Amateur Radio Station (VE2AGQ) was pressed into service as the Longue Pointe terminal of the link while a No. 52 Wireless Set was despatched to Fire Headquarters. Within four hours of the receipt of the order a link was in operation handling traffic both by phone and CW for all units taking part in the fire fighting. During the latter stage of the fire, HQ Quebec Command Signal Station also entered the net. Military personnel handled the Terrebonne terminal while civilian tels technicians of the workshop handled the Longue Pointe Station.

Watch was maintained on a 24-hour basis and a total number of 267 operational messages were handled during the period of seven days the link was in operation. A listening watch was also maintained after normal workshop hours on the Amateur Radio Stations of ZU2345, Major J.H.F. Read and SD21273 WOII T.M. Mimee, and both of these stations entered the net during periods when the Longue Pointe Station was off the air for servicing.

On the night of 23 Aug a searchlight manned by workshop personnel was operating as a marker beacon at Fire Headquarters.

All personnel taking part were highly commended by the GOC and civilian supervisory personnel in the fire area. Particular mention should be made of the tels technicians of this workshop who volunteered their services in running the Longue Pointe Radio Station.

FROM THE OLD TIMER

If you don't stand for something — you will fall for anything.

The wilder a man is about a woman the easier it is for her to tame him.

A sugar daddy is a form of crystalized sap.

There are two kinds of circles — the kind you go round in, and the kind you get from going around.

When speaking of their pasts, men boast, women confess.

When you point your finger at somebody else, remember you have three fingers pointing at yourself.

Even if you are on the right track, you will be run over if you continue to sit there.

WESTERN COMMAND

The following units have been activated since the Reserve Force was reorganized at the end of the war.

15 Inf Wksp	87 LAD
41 HAA Wksp	130 LAD
154 LAD	

These units all share the same accommodation and, since Sept 48 have been combined for training purposes into a single unit known as the Vancouver Group RCEME Reserve.

Accommodation and facilities have always been excellent and the Reserve unit has benefited greatly from a close association with 214 Base Wksp which is located nearby. Commencing with the 1949-50 training year, the unit has undergone a complete internal reorganization which is still underway. This is proceeding according to successive planned steps which are outlined hereunder.

First, the training program has been revamped and set up on a very firm basis following, in general, the syllabus sent from AHQ in Nov 48 but freely adapted to suit local conditions. Broadly speaking, the object of the training is to give recruits a firm basic training in general military subjects together with sufficient experience in specific trades to familiarize them with the requirements of the army tradesmen. No attempt or claim is made to actually train tradesmen from raw recruits, but an effort is made to bring such men to the stage where they could obtain a qualification by attending the Active Force school.

The syllabus has been arranged for classes of four weeks duration, ie, four two-hour parades, so as to have a minimum of interference from inspections or absenteeism. An outline of the classes so far established follows:

Class 1 Elementary GMT for recruits.

Class 2 Driver training aimed to qualify personnel for standing orders. This class includes one full Sunday of driving practice.

Class 3 Elementary recovery aimed at general familiarization with recovery vehicles.

Class 4 (a) Driver Mech training is being run as a pooled effort for all units in Vancouver and is of 10 weeks (3 hrs per week) duration. This course takes place on a night other than the regular parade night.

(b) Armament training aimed at familiarizing personnel with various artillery equipment. Four parades are spent on each equipment.

(c) Machinist training aimed at teaching the men simple machinery operations and in giving help in the manufacture of some simple project.

(d) Welding aimed again at showing the men the basic use of blacksmith and welding tools and assisting him in manufacturing a simple project.

Class 5 GMT which is more advanced than Class 1.

Class 6 A special home assignment course for Sr NCOs on subjects selected from the Sr NCO qualification syllabus.

Class 7 More advanced than first GMT.

Class 8 More advanced than first GMT.

Class 9 More advanced recovery.

Control is maintained by making Classes 1, 2, 3 and 5 a prerequisite to any of the trades training courses. Regular attendance and attention to duty is of course required before a man is given credit for any class. Individual training records are maintained for each man showing the record of classes completed.

Personnel for instructing the various classes and for carrying on the administrative duties of the unit at present comprise about one half the effective strength of the unit, but with a firm well regulated training plan working, new recruits have been coming in of their own accord. New classes in other RCEME subjects, for which the establishment allows equipment, are being planned as the need arises.

The second step of complete reorganization has been to straighten out and revamp our facilities in order to ease the burden of administration and to improve the appearance of the unit. Valuable but limited help has been rendered in this regard by A&T personnel and (AF) personnel from 214 Base Wksp, particularly in the setting up of training aids for the driver mechanic course. Further assistance has been obtained from unit personnel by the holding of a Sunday 'housekeeping' scheme at the armoury. By this method the tech stores have been reorganized according to regular army procedure (taking tech stores of 214 Base Wksp as a model), the blacksmith and welding shop has been cleaned out and properly set up; and considerable work has been done in the canteen. These Sunday schemes have proven very successful; a major contribution to this success being made by the unit cook who has prepared excellent meals as an added attraction.

The above program having been well started, plans are being prepared for an extensive recruiting campaign with an objective of 10 recruits per month. Even without trying, twelve recruits appeared between 15 Sept and 1 Dec 49 and it is hoped that the publicity planned will achieve the objects set for the year 1949-50.

(131 LAD continued from Page 13)

of battle). That meant, if we got caught with more vehicles in the shop than allowed, and another run was being made, we had to work either right through or in shifts until the work was completed, at least on the Rams over our LOB allowance.

(Ed. This is the first of two installments covering the operation of 123 LAD. In the second we will follow the unit out of Sittard, across the Rhine and until the disbandment in July 45.)

* * * * * * * * *

Nowadays nobody cares how bad your English is if your Scotch is good.

* * * * * * * * *

It isn't so hard to live on a small salary if you don't spend too much money in trying to keep it a secret.

— Capper's Weekly

The School Marches On

Lt Col J.R. Dunlop, OBE, ED, succeeded Lt Col W.S. Hunt as CO the RCEME School on 16 Dec 49. Lt Col Hunt becomes a staff officer in DWD at AHQ, Ottawa.

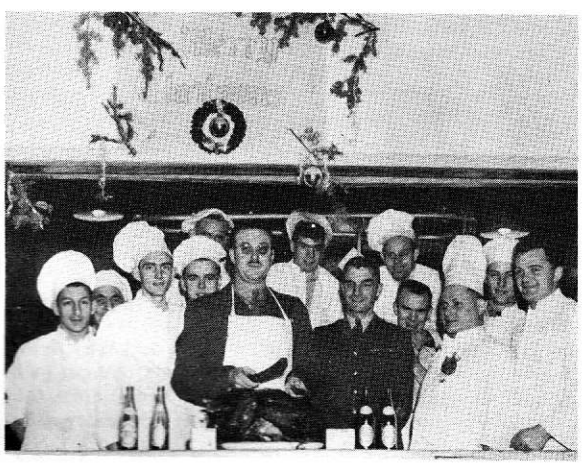
The ceremonial parade commanded by the new CO marched through the camp from the parade square to the drill hall where the handing over of command took place. After these ceremonies, Lt Col Hunt paid informal visits to the sergeants' and men's messes where presentations were made by the men to Mrs Hunt, followed by his final farewell to the officers of the school at their mess.

Lt Col Dunlop in his first message to his new command assured them there would be no 'new broom' tactics employed in the change. "The only changes likely will be those which would take place in the normal course of events and had Col Hunt remained", he said.

Lt Col Hunt says goodbye to the senior NCOs. Left to right: S/Sgt A. Rae, Sgt H. Taylor, Sgt J. Cummings (behind Lt Col Hunt), Sgt A. Maw and WOI G. Collins.

It was a 'green' Christmas at the School this year, the day being clear and mild with only a slight trace of snow to be seen. The Commanding Officer, Lt Col J.R. Dunlop OBE, ED, and his staff officers played host to the warrant officers and senior NCOs in the Officers' Mess from 1100 to 1130 hours. WO I Thomas proposed a toast to the CO and members of the Officers' Mess, which was responded to by Lt Col Dunlop. All present were busily exchanging compliments of the season and picking up the 'gen' on Santa's visit around the camp when the time came for all hands to adjourn to the Sergeants' Mess.

The CO carves the turkey for the kitchen staff.



In the Sergeants' Mess, while the cheer flowed once more, Lt Col Dunlop proposed a toast to the RSM and members of the Mess; this toast was responded to by the PMC, WO I Thomas, and the RSM WO I G. Collins.

The Area Commander, Brig G. Walsh CBE, DSO, called at the Mess and paid his respects. At 1230 hours the members of both Messes went to the Men's Mess where the senior NCOs and WOs ably assisted by the officers, served the Christmas dinner to the men.

Following the dinner the men adjourned to the Canteen for further refreshments while Lt Col Dunlop, ably assisted by Lt R.H. Mahar the Unit Accounts and Catering Officer, and the Sergeant Cook Sgt E.C. Digweed, served dinner to the kitchen staff who had laboured so long to prepare the feast for the men.

The staff responsible for the dinner arrangements were Lt R.H. Mahar, Sgt E.C. Digweed and Pte Anderchuk. There were no complaints from any of the one hundred and fifty beaming faces at the tables so it is presumed that all went well. The QM, Capt H.B. Lightfoot, reported one lad who was slightly perturbed because his monster drum stick had a bone in the middle. (Passed to the QMG for investigation — through the proper channels, of course.)

Dinner in the Sergeants' Mess was served at 1430 hours -- a full course turkey dinner. Some of the officers who had assisted at the serving of the men's meal ate in the Mess also.

The CO and the RSM visited the school personnel who were confined in the Kingston Military Hospital over the Christmas holiday, and distributed comforts and offered words of cheer.

BOLTS an' ASSORTED CLIPS by ar-vek-tels

TO WIN -- be **RIGHT** - graciously
be **POSITIVE** - diplomatically
be **EMPHATIC** - pleasantly
be **AGGRESSIVE** - tactfully
be **BRIEF** - politely

RCEME INSPECTOR — 1747

Frederick the Great of Prussia wrote in his "The Instructions of Frederick the Great for His Generals" concerning transport thus:-

"Inspectors are required for the horses and the vehicles. The care that these men should have for their (horses and vehicles) preservation is of great consequence, for if they broke down without your being able to replace them your whole project will be halted. It is necessary for the general to keep his eye on all this."

Contributed by Major J.P. Sherren.

Rookie: You say you were brought up in a tough neighborhood, Captain?
Captain: Yep, It was so tough, a cat with a tail was a tourist.

When Eddie, the noticeably slow moving and inefficient clerk in a small-town general store, wasn't in evidence one morning, a customer asked: "Where's Eddie? Ain't sick, is he?"

"Nope, he ain't sick," replied the proprieter. "He's just not working here any more."

"Got anybody in mind to fill the vacancy?" responded the curious villager.

"Nope," said the proprietor. "Eddie didn't leave no vacancy."

Better make certain that when you get a posting, you will leave a vacancy.

Man (to small son of one of his workmen who has met with an accident): "When will your dad be fit for work again?"

Boy: "Can't say for certain, but it will be a long time."

Man: "What makes you think that?"

Boy: "Cause compensation's set in."

"What's the cleanest thing these days?"
"A dollar bill. Not even a germ can live on

— Colorado Engineer

US Patent 1,162,371 has been issued for an outstanding brake lining which is made up as follows: Three parts, by volume, of ground bones, 30 parts of Epsom Salts and two gallons of beer slops. This makes a non-imflammable compound or saturant to apply to a suitable fabric tape to form brake lining.

The decoction of ground bones should have a specific gravity of 1.01 to 1.02 and may be made up by boiling 3 lb of ground bone in five gallons of water. The same bones may be used over again, with or without fresh bone being added, so long as the decoction comes up to the required specific gravity.

To each gallon of this liquid add twice the quantity of ale or beer (or malt or beer vinegar). The vinegars are less costly, but the beer will give equal results.

Think we're kidding you? We aren't. This recipe was part of a paper read to the SAE, actually covers a patent (1915) for a brake lining that sold several millions of feet. Shomebody Shay Shtop?

Three veterans just back from overseas went into the White Lunch and found the only table available already occupied by an elderly spinster. Deciding they wanted a little privacy, they sat down and the conversation went something like this:

First Vet: Boy, life overseas sure was tough. I didn't have a bath in eight months.

Second Vet: Think that's bad? Why I couldn't wash my hands for four weeks.

Third Ditto: We were so busy I couldn't change my underwear in five months.

At that point the old gal looked up and said: "Would one of you stinkers mind passing the salt?"

— The Western Commander

Husband: "I'll bet if you were real sweet to the landlord he'd stop asking us for the rent."
Wife: "No, darling, that doesn't work."

GASOLINE MILEAGE

While it has long been known that a car's best gasoline mileage is attained at steady speeds of between twenty and forty miles an hour, it is interesting to note results of recent tests by several automotive firms. They show that a car that gets twenty-one miles per gallon at such speeds generally gets only sixteen miles per gallon at sixty miles per hour and nine miles at eighty per hour. Moreover, they prove that fast acceleration and erratic speeds can cut gasoline mileage as much as fifty per cent below that attained by steady driving and moderate acceleration.

— TBA News

PERSONALITIES

Lt Cols J.R. Dunlop, K.H. McKibbin and Major G.G. Cavaghan have successfully completed the Canadian Army Staff Course and have been posted to command RCEME School, GSOI DMT and DAAG (RCEME) in D Army Pers, respectively.

Lt Col C.W. Jones is now DDME

Lt Col R.A. Campbell, Majors G.T. Kirk, J.P. Sherren and Capt E.W. Laver are attending the 1950 Canadian Army Staff College

Major D.A. Campbell (VDE) is attending the University of Michigan on post graduate studies.

Major V.W. Bethel is attached to REME as exchange officer in the UK.

Capt K.L.F. Coupland is with DAD, not DVD

POSTINGS

Lt Col W.S. Hunt to DWD, AHQ
Capt H.L. Beanlands to 6 Sec A&T Staff, Halifax
Capt D.H. Cumming to 2 Sec A&T Staff, Toronto
Capt G.E. Grainger to 3 Coy, Picton, Ontario
Capt G.A. Belcher to 204 Base Workshop, London
Capt H.L.M. King to OIC 206 Workshop Toronto
Capt J.N. Pinder-Moss to the School
Capt A.N.P. Roberts to HQ RCEME, Halifax
Capt F.J. Sergie to the School
Capt A.R. Thomsen to Admin Officer, DME
Lieut E.P. Bishop to VDE
Lieuts L.F. Holland, H.F. Protheroe, B.H. Goodings, H.W. House, W.M. James, R.H. Sandilands, to DME.
Lieuts J.A. McKinnon, P.A. Tuck, W.J.A. Groom, W.J. Jamieson, W.J. Mildon to the School Staff
Lieuts G.E. Ball and N.G. Lane to 17 Coy, London.
Lieuts J.J.E. Cuddihey and L.H. Love to 205 Workshop, Borden.
Lieut B. Deibert to 5 Coy, Quebec
Lieuts H.P. Edmunds and F.G. Johnson to 204 Workshop London
Lieuts S.H.J. Fleming and B. Yarymowich to 202 Workshop, Montreal
Lieuts T.J. Foskett and G.L. O'Brien to 13 Coy
Lieut D.H. Fraser to 6 Coy Halifax
Lieuts R.A. Hill, J.J. Tevlin and R.W. Vollett to 2 Coy Malton
Lieut J.J. Kane to 7 Coy, Coldbrook, NB.
Lieut F.J. McNaughton to 10 Coy, Winnipeg
Lieuts J.R. Raby and W.W. Virtue to 11 Coy
Lieut D.N. Ross to 207 Workshop, Kingston
Lieut S.A. Girdler to 16 Coy, Whitehorse
Lieuts C.J. Hamilton and R.H. Hogue to 4 Coy, Montreal

Captains F. Coultish, G.L. Evans, A.W. Hughes, F.R. Kaye, R.R. Logan, R.L. MacDonald, G.P. Miggins, A.T. Roberts, W.G. Warren, H.E. McLaughlin and Lieut T. Lowe are attending the EME Officers' Course at the School.

Capts J.B. Dewhurst, T.R. Heal and V.D. Kenyon have passed the qualifying examinations for the Technical Staff Course of the Military College of Science in the UK.

Capt Herbert L. Beanlands, MBE, has been posted to 6 Coy, Halifax, from 2 Coy Malton, according to the Halifax Herald. The paper goes on to say "his old friends will be happy to learn" that the "well-known former citizen" has returned. Capt Beanlands will be A&T officer for the RCEME Reserve Force.

The following 2/Lieuts are continuing their university training as shown:

University of British Columbia

2/Lt North, P.H.

University of Alberta

2/Lt Chapman, F.W.

University of Saskatchewan

2/Lt Burton, G.R.
2/Lt Leonard, A.L.
2/Lt Prediger, P.
2/Lt Svab, W.G.

University of Manitoba

2/Lt Alexander, W.D.
2/Lt Beach, R.K.
2/Lt Calvert, J.L.
2/Lt Shaw, R.N..

University of Western Ontario

2/Lt Grant, D.A.

University of Toronto

2/Lt Chess, G.F.
2/Lt Clarabut, J.E.
2/Lt Evans, R.J.
2/Lt Haggins, W.J.N.
2/Lt Joslin, K.R.
2/Lt Moody, J.W.
2/Lt Rodgers, R.E.
2/Lt Geary, D.V.

Queen's University

2/Lt Carruthers, F.R.
2/Lt Crowson, J.S.
2/Lt Jones, E.G.
2/Lt Pfeiffer, H.C.R.

McGill University

2/Lt McKay-Keenan, R.A.
2/Lt Sheehan, J.O.

University of New Brunswick

2/Lt Libbey, R.W.
2/Lt MacFarland, H.E.
2/Lt Martin, R.K.
2/Lt Shaw, W.R.

NS Tech College

2/Lt Delaney, J.D.
2/Lt Fougere, S.A.
2/Lt Lelacheur, J.W.
2/Lt MacDonald, J .A.
2/Lt Sainsbury, L.A.
2/Lt Savage, G.D.
2/Lt Wright, G.A.

Six ORs are taking their second year university and one is taking his first year:-

University of British Columbia

Cadet MacIntosh, R.L.
Cadet Sneddon, W.D.
Cadet Brost, E.R. (1st year)

University of Manitoba

Cadet Smithe, O.D.

Queen's University

Cadet Chess F.
Cadet Mahar, M.D.

University of Toronto

Cadet McKinlay, M.D.

Obituary

Cfn A.B. Tyler, SB-135384, No. 2 Coy RCEME (206 Workshop) was killed on 12 Nov 49, near Burk's Falls, Ontario, when his vehicle, a 1/2-ton panel truck, skidded and overturned.

As requested by his wife, a semi-military funeral service was held on 16 Nov 49. Pallbearers from No. 2 Company tended the casket and an escort of twenty other ranks and officers of his unit were in attendance. The service took place at Port Credit, Ontario, Major Forth (Comd Chaplain 'P') officiating. The body was laid to rest in Park Lawn Cemetery, Toronto.

Cfn Tyler was born 27 Aug 23 at Lakeview, Ontario and had served overseas with the Princess Louise Dragoon Guards. He returned to Canada in 1945, where he was discharged. He enlisted in the CA (AF) at Toronto, on 19 Jan 49 and was sent on course to the RCEME School. Upon completion of his course he was posted to No. 202 Base Workshop and on 3 Aug 49 was posted to No. 2 Coy.

Cfn Tyler is survived by his wife and 6-year old son, who reside in Toronto.

* * *

Cfn A.V. Gilliam, SC12385, of 208 Workshop Ottawa, was accidently killed while riding his motorcycle on 22 Oct 49. A military funeral was held to the soldiers' plot in Notre Dame Cemetery, attended by the OC Capt R.D. Maybee, and workshop personnel under S/Sgt F. Babb formed an escort and firing party.

Cfn Gilliam was born 31 Jul 13 and served from 1936 to 39 with the Governor General's Foot Guards and four years overseas with the RCASC during the war. He was a watchmaker by trade and when he re-enlisted in Jun 1947 was allocated to RCEME.

212 WORKSHOP SHILO

Front Row: Cpl W. Blair, Sgt F. Cameron, Sgt R. Seeley, S/Sgt C. Sedger, QMS E. Harrop, Capt V.D. Kenyon, Lt Col C.M.R. Elmsley, ASM R. Lawson, S/Sgt J. Parker, Sgt A. Balmer, Cpl L. Lewis, Cpl F. McCallum. (2nd Row) Mr. Brosseau, L/Cpls C. Hildebrand, M. Sitter, S. Gillis, Cfn A. Hunter, G. Edwards, G. Forbes, C. Rendell, L/Cpls J. Fawson, G. Mitchell, C. Pauley, Cpl C. Jackson, Cfn A. Prior, A. Guillemette, Mr. Troney. (3rd Row) J. Dean, Cfn G. Swedberg, H. Sutton, G. Walters, A. Patterson, C. Gunness, Pte. K. Hyatt, Cpl T. Fitzgerald, Cfn R. Sarvis, S. Holomay, W. Forbes, W. Neil, E. Barron, Mr. J. Sloboda. (4th Row) G. Yule, A. Fischer, R. Chalmers, A. Bennett, Spr R. Rolffe, Cfn R. Hall, W. Llyod, E. Taylor, C. Franklin, J. Klassen, M. Foreman, Mr. A. Thompson, W. Palahnuk, M. Yule.